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Food and Agriculture Organization of the United Nations

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ASSESSMENT**

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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).

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The Global Forest Resources Assessment 2005 Country Report Series is designed to document and make available the information forming the basis for the FRA 2005 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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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 <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
Hunting Service Co. LTD National land and water conservation, project wood land resources mapping project.	M	Wood Land Resources	1993	The source of data was Landsat imagery supported by extensive field work and air photography.
National symposium on Desertification.	M	Report (work paper)	1996	Understanding of Desertification, its Causes and Socio-Economic Impacts

1.2.2 Classification and definitions

National class	Definition
Other wood 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 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
Other land	Includes all land not classified as "Other Woodland"

1.2.3 Original data

1993

National Classes	Area (km ²)
P1 - Mangrove woodland	9.27
P2 - Cultivated date palm	51.81
P3 - Hyphaene woodland	50.16
P4 - Salvadora thicket	107.96
P5 - Tihama Acacia woodland	175.61
P6 - Tihama Acacia woodland and agriculture	273.96
P7 - Plains agriculture	6,733.70
P8 - Acacia-Commiphora woodland on gravel plains	1,081.68
P9 - Range/bare land	8,872.28
E1. Acacia- Commiphora woodland /shrubland	12,430.15
E1a. Acacia- Commiphora woodland /shrubland	322.65
E2. Terraced Agriculture with Acacia shrubland	2,481.37
E3. Riverine Forest	3.00
E4 - Riverine agriculture with forest trees	61.46
E5 - Agriculture with trees on field margins	3,749.18
E6 - Agriculture predominantly terraced	4,567.79
E7. Riverine Acacia woodland.	53.59
E8 - Agriculture and bare lands	5,837.08
E9 - Range/bare land	13,237.76
C1. Acacia open woodland.	3,321.16
C3 - Date palm agriculture	345.26
C4. Tamarix woodland	427.47
C5 - Zizyphus orchards	24.18
C6 - Agriculture	3,343.05
C7 - Range/bare land	81,564.01
J - Juniper woodland remnant	21.32
M1. Anogeissus woodland.	56.18
M2. Anogeissus Parkland.	6.78
M3. Anogeissus woodland with clearings	6.20
M4. Commiphora -Acacia shrubland	50.53
M5. Commiphora -Acacia woodland	51.50
M6 - Range/bare land	1,196.87
Other land	529.48
TOTAL MAPPED AREA	151,044.45

The report provides the following reclassification:

Woodland: P1, P3, P4, P5, P8, E1, E1a, E3, E7, C1, C4, M1, M2, M4, M5, J plus 50 percent of the mixed classes (P6, E2 and M3)

Traditional agroforestry: E4, E5 and C5

Date palms: P2, C3.

Based on this reclassification, the report provided the following summary of woodland resources by region:

National class	Area (km ²)	
	Woodland	Agroforestry and Date Palms
Coastal Plains	1561.66	51.81
Escarpment and W. Mountains	14050.08	3810.64
Central Highlands and Wadis	3748.63	367.44
Mahra Woodland	168.09	0
Juniper	21.32	0
TOTAL	19548.78	4231.89

1.3 Analysis and processing of national data

1.3.1 Calibration

The total area mapped is only part of the country (excludes the islands), but covers all the main woodlands. Adjustments have, therefore, been made to the “Other land” category and no changes have been made to the estimated area of woodland.

1.3.2 Estimation and forecasting

Available data is for 1993. Estimation and forecasting is based on expert estimations after reclassification.

1.4 Reclassification into FRA 2005 classes

The definitions used by FAO for the global forest resources assessment differs from the ones used by Hunting 1993. More specifically, the FAO definitions distinguish between forests and other wooded land and include a category on other land with tree cover, where the forest definition in terms of land cover is met, but where the main use isn't forestry.

Below is the reclassification matrix used:

National Classes	Forest	Other wooded land	Other land	Other land with tree cover	Inland water
P1 - Mangrove woodland	100%				
P2 - Cultivated date palm			100%	100%	
P3 - Hyphaene woodland	100%				
P4 - Salvadoria thicket		100%			
P5 - Tihama Acacia woodland	60%	40%			
P6 - Tihama Acacia woodland and agriculture	50%		50%		
P7 - Plains agriculture			100%		
P8 - Acacia-Commiphora woodland on gravel plains	50%	50%			
P9 - Range/bare land			100%		
E1. Acacia- Commiphora woodland /shrubland	20%	80%			
E1a. Acacia- Commiphora woodland /shrubland	20%	80%			
E2. Terraced Agriculture with Acacia shrubland		50%	50%		
E3. Riverine Forest	100%				
E4 - Riverine agriculture with forest trees			100%		
E5 - Agriculture with trees on field margins			100%		
E6 - Agriculture predominantly terraced			100%		
E7. Riverine Acacia woodland.	100%				
E8 - Agriculture and bare lands			100%		
E9 - Range/bare land			100%		
C1. Acacia open woodland.	60%	40%			
C3 - Date palm agriculture			100%	100%	
C4. Tamarix woodland		100%			
C5 - Zizyphus orchards			100%	100%	
C6 - Agriculture			100%		
C7 - Range/bare land			100%		
J - Juniper woodland remnant	100%				
M1. Anogeissus woodland.		100%			
M2. Anogeissus Parkland.		100%			
M3. Anogeissus woodland with clearings		50%	50%		
M4. Commiphora -Acacia shrubland		100%			
M5. Commiphora -Acacia woodland	50%	50%			
M6 - Range/bare land			100%		
Other land			100%		

Results after reclassification:

National Classes	TOTAL (km ²)	Woodland (Hunting, 1993) (km ²)	Forest (km ²)	Other wooded land (km ²)	Other land (km ²)	Other land with tree cover (km ²)
P1 - Mangrove woodland	9.27	9.27	9.27			
P2 - Cultivated date palm	51.81	0			51.81	51.81
P3 - Hyphaene woodland	50.16	50.16	50.16			
P4 - Salvadora thicket	107.96	107.96		107.96		
P5 - Tihama Acacia woodland	175.61	175.61	105.37	70.24		
P6 - Tihama Acacia woodland and agriculture	273.96	136.98	136.98		136.98	
P7 - Plains agriculture	6733.70	0.00			6733.70	
P8 - Acacia-Commiphora woodland on gravel plains	1081.68	1081.68	540.84	540.84		
P9 - Range/bare land	8872.28	0.00			8872.28	
E1. Acacia- Commiphora woodland /shrubland	12430.15	12430.15	2486.03	9944.12		
E1a. Acacia- Commiphora woodland /shrubland	322.65	322.65	64.53	258.12		
E2. Terraced Agriculture with Acacia shrubland	2481.37	1240.69		1240.69	1240.69	
E3. Riverine Forest	3	3	3			
E4 - Riverine agriculture with forest trees	61.46	0.00			61.46	
E5 - Agriculture with trees on field margins	3749.18	0.00			3749.18	
E6 - Agriculture predominantly terraced	4567.79	0.00			4567.79	
E7. Riverine Acacia woodland.	53.59	53.59	53.59			
E8 - Agriculture and bare lands	5837.08	0.00			5837.08	
E9 - Range/bare land	13237.76	0.00			13237.76	
C1. Acacia open woodland.	3321.16	3321.16	1992.696	1328.464		
C3 - Date palm agriculture	345.26				345.26	345.26
C4. Tamarix woodland	427.47	427.47		427.47		
C5 - Zizyphus orchards	24.18	0			24.18	24.18
C6 - Agriculture	3343.05	0.00			3343.05	
C7 - Range/bare land	81564.01	0.00			81564.01	
J - Juniper woodland remnant	21.32	21.32	21.32			
M1. Anogeissus woodland.	56.18	56.18		56.18		
M2. Anogeissus Parkland.	6.78	6.78		6.78		
M3. Anogeissus woodland with clearings	6.2	3.1		3.1	3.1	
M4. Commiphora -Acacia shrubland	50.53	50.53		50.53		
M5. Commiphora -Acacia woodland	51.5	51.5	25.75	25.75		
M6 - Range/bare land	1196.87	0.00			1196.87	
Other land	529.48	0			529.48	
TOTAL	151044.45	19549.78	5489.53	14060.25	131494.68	421.25

Summary results:

FRA 2005 Categories	1993 (1000 ha)
Forest	549
Other wooded land	1406
Other land	13149
...of which with tree cover ¹⁾	42

Estimation and forecasting

There is some reduction in coastal plain OWL due to charcoal making and in Escarpment and west. Mount in the Riverian forest (*Ficus sp.*, *Brenadia sp.*, *Tamarindus sp.*) due to the removal of trees for other purposes than fuelwood. At the same time, there is natural regeneration of *Acacia* and *Zizyphus* forests in most Mountain regions due to using gas instead of fuelwood.

There is, however, no detailed information on the areas of reduction/natural regeneration, so it is assumed that they more or less outweigh each other so that the total areas remain constant over time.

The total area mapped is only part of the country (excludes the islands), but covers all the main woodlands. Adjustments have, therefore, been made to the "Other land" category.

1.5 Data for National reporting table T1

FRA 2005 Categories	Area (1000 hectares)		
	1990	2000	2005
Forest	549	549	549
Other wooded land	1406	1406	1406
Other land	50842	50842	50842
...of which with tree cover ¹⁾	42	42	42
Inland water bodies	0	0	0
TOTAL	52797	52 797	52 797

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
National symposium on Desertification.	L	Report (work paper)	1996	Yemen Traditions in Natural Conservation

2.2.2 Original data

National class	Definition
Private ownership	Land owned by individuals and families. It represents about 80 %.
Public ownership	Land owned by the government. It represents about 5 %.
Other ownership	It represents about 15 %.

Note: This classification is based on expert estimates.

2.2.3 Estimation and forecasting

The percentages above have been applied to the area of forest and other wooded land in Table T1.

2.3 Data for National reporting table T2

FRA 2005 Categories	Area (1000 hectares)			
	Forest		Other wooded land	
	1990	2000	1995	2000
Private ownership	439	439	1125	1125
Public ownership	27.5	27.5	70.3	70.3
Other ownership	82.4	82.4	211	211
TOTAL	549	549	1406	1406

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
Hunting Service Co. LTD National land and water conservation, project wood land resources mapping project.	M	Wood Land Resources	(1993)	The source of data was Landsat imagery supported by extensive field work and air photography.
FAO/ Government Cooperation Programme	L	PLAN OF OPERATION	1988	Forestry Development in Republic of Yemen, Phase

3.2.2 Classification and definitions

National class	Definition
Multiple purpose	Same as FRA 2005

3.2.3 Original data

Table T1 has been used as input. All forests and other wooded lands fulfill multiple functions.

3.3 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						
Conservation of biodiversity						
Social services						
Multiple purpose	549	549	549	not appl.	not appl.	not appl.
No or unknown function				not appl.	not appl.	not appl.
Total - Forest	549	549	549	not appl.	not appl.	not appl.
Other wooded land						
Production						
Protection of soil and water						
Conservation of biodiversity						
Social services						
Multiple purpose	1406	1406	1406	not appl.	not appl.	not appl.
No or unknown function				not appl.	not appl.	not appl.
Total – Other wooded land	1406	1406	1406	not appl.	not appl.	not appl.

3.4 Comments to National reporting table T3

Some areas are designated for Conservation of biodiversity, but are still used by communities for other purposes.

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
Plan of districts development	L	Parts (coastal region)	2002	Plan of development Broom Maifaa district and Plan of development Rodoom district (Public Work Project).

4.2.2 Classification and definitions

National class	Definition
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.

4.2.3 Original data

National class	Area (000 ha) 1995
Modified natural	2000
Semi-natural	388
TOTAL	2388

4.3 Analysis and processing of national data

It is assumed that all the semi-natural areas fall within the areas classified as forests.

4.4 Reclassification into FRA 2005 classes

388 000 ha of forest are classified as semi-natural, the remaining forests and all other wooded land are classified as modified natural.

4.5 Data for National reporting table T4

FRA 2005 Categories	Area (1000 hectares)					
	Forest			Other wooded land		
	1990	2000	2005	1995	2000	2005
Primary						
Modified natural	161	161	161	1406	1406	1406
Semi-natural	388	388	388			
Productive plantation						
Protective plantation						
TOTAL	549	549	549	1406	1406	1406

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
Hunting Service Co. LTD National land and water conservation, project wood land resources mapping project.	M	Wood Land Resources	(1993)	The source of data was Landsat imagery supported by extensive field work and air photography.
Inventory of natural forest in Yemen, Consultant .	M	Management of forestry (Parts).	1988	Saad Allah, Jamal, Project development of forestry – Yemen.

5.2.2 Classification and definitions

National class	Definition
Growing stock	Volume over bark of all living trees more than 7 cm in diameter at breast height. Includes the stem from the ground level up to a top diameter of 5 cm, It does not include branches.

5.2.3 Original data

National class	Volume (million cubic meters over bark)	
	Woodland	
	1993	1995
Growing stock	16.8	16.8

The growing stock of all woodlands (about 2 million ha) is 16.8 million cubic meters. The area o woodland correspond to the area of Forest and Other wooded land together in table T1, but there is no information that allow for a further subdivision of these figures.

5.3 Analysis and processing of national data

5.3.1 Estimation and forecasting

The growing stock figure from 1995 has been used for all three reporting years.

5.4 Data for National reporting table T5

FRA 2005 Categories	Volume (million cubic meters over bark)		
	Forest + Other wooded land		
	1990	2000	2005
Growing stock	16.8	16.8	16.8
Commercial stock	—	—	—

Specification of country threshold values	Unit	Value	Complementary information
1. Minimum diameter at breast height of trees included in Growing stock (7)	cm	7	
2. Minimum diameter at the top end of stem (5) for calculation of Growing stock	cm	5	
3. Minimum diameter of branches included in Growing stock (W)	cm		Not included
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		
6. Have any of the above thresholds (points 1 to 4) changed since 1990	Yes		
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
Hunting Service Co. LTD National land and water conservation, project wood land resources mapping project.	M	Wood Land Resources	(1993)	The source of data was Landsat imagery supported by extensive field work and air photography.
Inventory of natural forest in Yemen, Consultant .	M	Management of forestry (Parts).	1988	Saad Allah, Jamal, Project development of forestry – Yemen.
FAO. Working Paper 82. 2004. FAO/Forests department	M	Biomass expansion factor. Root-shoot ratio.	2004	
FAO. Working Paper 81. 2004.FAO/ Forests 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 final data for table T5 were used as input for the biomass estimations

6.3 Analysis and processing of national data

6.3.1 Calibration

Estimation and forecasting calculation of living biomass for Forests + OWL (No Gsby species).

G. stock (Million m3)	Basic density (tones/m3)	Stem biomass (million tones)	Biomass exp. fact	A.G biomass (million tones)	Root-Shoot ratio	B.G biomass (million tones)
16, 8	0.76	12.77	2	25.5	0.43	11.0

For tropical Asia, deciduous and broadleaved forests:

Basic wood density for acacias is 0.76

R = 0.43

BEF = 2

Dead-live ratio = 0.14

6.3.2 Estimation and forecasting

The same figure has been used for all three reporting years.

6.4 Data for National reporting table T6

FRA 2005 Categories	Biomass (million metric tonnes oven-dry weight)		
	Forests + Other wooded land		
	1990	2000	2005
Above-ground biomass	25.5	25.5	25.5
Below-ground biomass	11.0	11.0	11.0
Dead wood biomass	5.1	5.1	5.1
TOTAL	41.6	41.6	41.6

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, fomic, 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
IPCC/FAO. 2004. Guidelines for country reporting, working paper 82. FAO, Rome.	L	Carbon in above and below-ground biomass, Carbon in dead wood and Carbon in litter= 50% of the biomass in 6.5 table.	2004	

7.2.2 Classification and definitions

National class	Definition
Carbon in above-ground biomass	Same as FRA 2005.
Carbon in below-ground biomass	Same as FRA 2005
Carbon in dead wood biomass	Same as FRA 2005
Carbon in litter	Same as FRA 2005
Soil carbon	Same as FRA 2005

7.2.3 Original data

The final data for table T6 was used as input for carbon estimation.

7.3 Analysis and processing of national data

The same figure has been used for all three reporting years. Carbon in litter and soil carbon has not been estimated due to lack of data.

7.4 Data for National reporting table T7

FRA 2005 Categories	Carbon (Million metric tonnes)		
	Forests + Other wooded land		
	1990	2000	2005
Carbon in above-ground biomass	12.8	12.8	12.8
Carbon in below-ground biomass	5.5	5.5	5.5
Sub-total: Carbon in living biomass	18.3	18.3	18.3
Carbon in dead wood	2.6	2.6	2.6
Carbon in litter			
Sub-total: Carbon in dead wood and litter	2.6	2.6	2.6
Soil carbon to a depth of 30 cm	-	-	-
TOTAL CARBON	20.9	20.9	20.9

8 Table T8 – Disturbances affecting health and vitality

No quantitative data are available. However, disturbances by diseases are common in all OWL of Yemen. For example: Juniper diseases are currently widely spread in the northern boundaries between Yemen and Saudi Arabia in addition to the die back and wild fires. Also, some other species suffer from parasites, especially acacias in mountain regions. In some years, disturbances by different factors happen, but unfortunately there is no inventory.

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
Trees and shrubs of Yemen	M	National	1997	GCP/YEM/015/SWI
National Biodiversity Strategy and work Plan - Yemen	M	National	1999	NBSAWPY
IUCN Red list		Endangered and vulnerable plant species		

9.2.2 Classification and definitions

National class	Definition
Number of native tree species	Same as FRA 2005
Number of critically endangered tree species	Same as FRA 2005
Number of endangered tree species	Same as FRA 2005
Number of vulnerable tree species	Same as FRA 2005

9.2.3 Original data

FRA 2005 Categories	Number of species (year 2000)
Native tree species	534
Critically endangered tree species ¹⁾	3
Endangered tree species ¹⁾	28
Vulnerable tree species ¹⁾	128

¹⁾ From IUCN Red list. All plant species.

9.3 Data for National reporting table T9

FRA 2005 Categories	Number of species (year 2000)
Native tree species	534
Critically endangered tree species ¹⁾	ID
Endangered tree species ¹⁾	ID
Vulnerable tree species ¹⁾	ID

9.4 Comments to National reporting table T9

The number of native tree species includes shrubs.

The figures from the IUCN red list refer to all plant species, not only trees, so have not been included.

According to a national list, 8 species are considered critically endangered and 11 species endangered. These figures include both tree and shrub species.

10 Table T10 – Growing stock composition

10.1 National data

10.1.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Trees and shrubs of Yemen	M		1997	GCP/YEM/015/SWI

10.1.2 Original data:

National class / Species name (Scientific name and common name)	Growing Stock in Forests + OWL (million cubic meters)
	1995
<i>Avicennia marina</i> and <i>Rhizophora sp</i> (Mangrove)	0.005562
<i>Hypheana etbaica</i>	0.020064
<i>Acacia ehrenbergiana</i> , and <i>A.tortilis</i>	1.502230
<i>Acacia millifera</i> , and <i>Commiphera spp.</i>	1.568594
<i>Ziziphus sp.</i> , <i>Cordia sp.</i> , <i>Brenadia sp.</i> , <i>Trichilia sp.</i> , <i>Tamrandus sp</i> and <i>Ficus sp.</i>	0.694044
<i>Acacia sp.</i> and <i>Tamarix spp.</i>	11.328571
<i>Anogeissus sp.</i>	1.704262
<i>Juniper sp.</i>	0.002079
TOTAL	16.825

As this reporting table only refer to growing stock in Forest, and there are no separate figures available for forests and OWL in Yemen, the reporting table T10 has been left without data.

10.2 Data for National reporting table T10

National class / Species name (Scientific name and common name)	Growing Stock in Forests (million cubic meters)		
	1995	2000	2005
TOTAL			

11 Table T11 – Wood removal

11.1 FRA 2005 Categories and definitions

Category	Definition
Industrial wood removal	The wood removed (volume of roundwood over bark) for production of goods and services other than energy production (woodfuel).
Wood fuel removal	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
Household fuel wood marketing study, phase 2	H	North of Yemen (regional)	1988	Final report prepared for :UNDP/World Bank, Energy Sector Management Program.

11.2.2 Classification and definitions

National class	Definition
Wood fuel removal	The wood removed for energy production purposes, regardless whether for industrial, commercial or domestic use.

11.2.3 Original data

There is no data available for industrial wood removal. The World Bank (1988) estimates for fuel wood consumption in Yemen (about 4.7 million m³) but this has decreased in last decade, as a result of replacing it with gas in some districts of Yemen. Consumption data do not necessarily correspond to removals. Furthermore, removals of wood fuel do not only come from areas classified as Forest and other wooded land, a substantial part comes from the category "Other land". No data available has therefore been reported in the final table.

11.3 Data for National reporting table T11

FRA 2005 Categories	Volume in 1000 cubic meters of roundwood over bark		
	Forests + Other wooded land		
	1990	2000	2005
Industrial roundwood	n.a	n.a	n.a
Woodfuel	n.a	n.a	n.a
TOTAL for Country	n.a	n.a	n.a

11.4 Comments to National reporting table T11

Although no quantitative data have been reported in this table, there has been sharp decrease of the use of wood fuel during the last decade as a result of replacing it with gas.

12 Table T12 – Value of wood removal

12.1 FRA 2005 Categories and definitions

Category	Definition
Value of industrial wood removal	Value of the wood removed for production of goods and services other than energy production (woodfuel).
Value of woodfuel removal	Value of the wood removed for energy production purposes, regardless whether for industrial, commercial or domestic use.

12.2 National data

12.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Household fuel wood marketing study, phase 2	H	North of Yemen (regional)	1988	Final report prepared for :UNDP/World Bank, Energy Sector Management Program.
Environmental report of Yemen	L	National	2001	Yemen, Sanaa

12.2.2 Classification and definitions

National class	Definition
Value of woodfuel removal	Value of the wood removed for energy production purposes, regardless whether for industrial, commercial or domestic use.

12.2.3 Original data:

In 1990, the value of wood fuel was approximately 60 USD / m³. However, as the table T11 was reported with insufficient data on removed volumes, this table is also reporting insufficient data.

12.3 Data for National reporting table T12

FRA 2005 Categories	Value of roundwood removal (1000 USD)		
	Forests + Other wooded land		
	1990	2000	2005
Industrial roundwood	ID	ID	ID
Woodfuel	ID	ID	ID
TOTAL for Country	ID	ID	ID

13 Table T13 – Non-wood forest product removal

No data available for this reporting table

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

No data available for this reporting table

15 Table T15 – Employment in forestry

15.1 FRA 2005 Categories and definitions

Category	Definition
Primary production of goods	Employment in activities related to primary production of goods, like industrial roundwood, woodfuel and non-wood forest products.
Provision of services	Employment in activities directly related to services from forests and woodlands.
Unspecified forestry activities	Employment in unspecified forestry activities.

15.2 National data

15.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Department of forest reports.	L	Parts	2002	Field visiting to some area.
Report of honey bees project	M	Regional	2003	Field survey

15.2.2 Classification and definitions

National class	Definition
Primary production of goods	Employment in activities related to primary production of goods, like industrial roundwood, woodfuel and non-wood forest products.
Provision of services	Employment in activities directly related to services from forests and woodlands.
Unspecified forestry activities	Employment in unspecified forestry activities.

15.3 Data for National reporting table T15

FRA 2005 Categories	Employment (1000 person-years)	
	1990	2000
Primary production of goods		
Provision of services		
Unspecified forestry activities		
TOTAL		

15.4 Comments to National reporting table T15

Insufficient Data, however employment in honey products and trade, collecting and trade of fuel wood and charcoal making, woody handicrafts and cutting of woods and sale for construction and carpenter, and in collecting and sale of medicinal and aromatic plants and colorants and dyes is estimated at about 100 000 workers.