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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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Introduction

All the data provided in this report is based on the National Forest and Tree Resources Assessment and Monitoring (FAO, TCP/LEB/2903). The quality of the information is high for all available data.

TCP/LEB/2903 National Forest and Tree Inventory and Assessment of Lebanon became active in July 2003. The main objective of the project was to reinforce the capacity of the Directorate of Rural Development and Natural Resources (DRDNR) in collecting, compiling, analyzing and disseminating reliable and up-to-date information on the forest and trees outside the forest (TOF) resources of Lebanon through training of the national staff on forest and tree inventory.

During the project, a systematic grid of permanent sample plots was established in accordance with the forest inventory component of the FAO-NFA approach. Tracts (1 km x 1km) were established at every 4 minutes longitude and latitude (every 6-7 km) across Lebanon. On the systematic grid of tracts, data on the forest and trees outside forest (TOF), information on the resources, wood and non-wood-forest products and services (NWFPS), were measured, registered and analyzed in accordance with the specifications of the FAO-FORM support to National Forest Assessments and the additional national requirements for accurate statistics on the state of the resources.

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
National Forest and Tree Resources Assessment and Monitoring (FAO, TCP/LEB/2903)	H	Forests and OWL	2004	
Land Cover – Land Use Project (FAO, MOA 2002); based on satellite image 1998	M	Forests and Other Wooded Lands	1998	

MOA: Ministry of Agriculture; MOE: Ministry of Environment; NCRS: National Centre for Remote Sensing

1.2.2 Classification and definitions

National class	Definition
Forests	Same as FRA.
Other Wooded Lands	Same as FRA
Other Lands	Same as FRA

1.2.3 Original data

Data year: 2004 - Source: National Forest and Tree Resources Assessment 2003-2005 (FAO, FRA WP 95)

Data year: 1998 – Source: Land Cover-Land Use Programme (FAO - MOA, 2002, satellite image). This source was also used for estimating Other land with trees.

The total information of the land use area classes are expected and estimated based on the total area of the national area country, which is equivalent to 1,045,200 hectares.

LAND USE CLASS	1998 (hectares)	2004 (hectares)
Forest	133 712	139 376
Other Wooded Land	119 605	108 378
Other Land	791 589	797 152
...of which with trees (olives and fruit trees)	116 210	116 210
Inland Water	294	294
TOTAL	1 045 200	1 045 200
...of which land area	1 044 906	1 044 906

1.3 Analysis and processing of national data

1.3.1 Calibration

	1000 ha
FAOSTAT Land Area	1023
FAOSTAT Country Area	1040
FAOSTAT Inland Water Area (calculated)	17

Calibration done by land area in order to align with FAOSTAT figures:

Calibration factor: $1\,023\,000 / 1\,044\,906 = 0.9790354$

1.3.2 Estimation and forecasting

Data for 1998 was used for 2000 and the data for 2004 used for 2005

1.4 Reclassification into FRA 2005 classes

The classes used are the same as FRA 2005 classes

1.5 Data for National reporting table T1

FRA 2005 Categories	Area (1000 hectares)		
	1990	2000	2005
Forest	ID	131	136.5
Other wooded land	ID	117	106
Other land	ID	775	780.5
...of which with tree cover	ID	114	114
Inland water bodies	ID	17	17
TOTAL		1040	1040

1.6 Comments to National reporting table T1

At the time of submission of the FRA 2000 report, the results of the Land –Cover Land Use project (FAO-MOA, 2002, based on satellite image 1998) were not available yet. Therefore, the data provided in the FRA 2000 is not accurate as it was based on previous subjective estimates. The FAO National Forest and Tree Resources Assessment 2003-2005 (FAO, FRA WP 95) project has resulted in more precise data that would be used for further FRA reporting processes. The data provided by the LCLU project cannot be used to analyze the trend of land use change over time, because the definitions used are different from the FRA definitions. The difference in the definitions might also explain the apparent increase in the forest cover between 2000 and 2005.

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

Source: National Forest and Tree Resources Assessment 2003-2005 (FAO, FRA WP 95)

Data year: 2004

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
National Forest and Tree Resources Assessment and Monitoring (FAO, TCP/LEB/2903)	H	Forests and OWL	2004	
Land Cover – Land Use Project (FAO, MOA 2002); based on satellite image 1998	M	Forests and Other Wooded Lands	1998	

MOA: Ministry of Agriculture; MOE: Ministry of Environment; NCRS: National Centre for Remote Sensing

2.2.2 Classification and definitions

National class	Definition
Private ownership	Same as FRA.
Public ownership	Same as FRA
Other ownership	Same as FRA

2.2.3 Original data

Land Ownership	Forest (ha) 2004	OWL (ha) 2004
Private	84 183	86 702
Public	53 799	14 956
<i>State</i>	38 189	
<i>Municipality</i>	13 938	
<i>Communes</i>	1 672	
Unknown	1 394	6 720
TOTAL	139 376	108 378

2.3 Analysis and processing of national data

The original data from the National Forest and Tree Resources Assessment and Monitoring (FAO, TCP/LEB/2903) were used to estimate the land ownership for the year 2000, based on the percentage of each ownership category in 2004 and by applying these percentages on the forests and OWL areas in 2000 from table T1.

No data on forest area are available for 1990.

2.4 Data for National reporting table T2

FRA 2005 Categories	Area (1000 hectares)			
	Forest		Other wooded land	
	1990	2000	1990	2000
Private ownership		79		93.5
Public ownership		50		16
Other ownership		2		7.5
TOTAL		131		117

2.5 Comments to National reporting table T2

The private ownership comprises lands owned by individuals and by religious communities. The public ownership comprises land owned by the state, the municipalities and the communes which are groups of villages.

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
National Forest and Tree Resources Assessment and Monitoring (FAO, TCP/LEB/2903)	H	Designated functions	2004	

3.2.2 Classification and definitions

The national classifications are the same as FRA 2005.

3.2.3 Original data

Designation/protection status	Forests (ha)	OWL (ha)
Production	135 752	105 018
Natural Reserve	3 624	3 360
Protection	0	0
Total	139 376	108 378

3.3 Analysis and processing of national data

3.3.1 Calibration

The areas are multiplied by the calibration factor: 0.9790354

3.3.2 Estimation and forecasting

The data for 2004 have been used for the reporting year 2005. No data are available for 1990 and 2000.

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			133			133
Protection of soil and water						136.5
Conservation of biodiversity			3.5			3.5
Social services						136.5
Multiple purpose				not appl.	not appl.	not appl.
No or unknown function				not appl.	not appl.	not appl.
Total - Forest			136.5	not appl.	not appl.	not appl.
Other wooded land						
Production			103			103
Protection of soil and water						106
Conservation of biodiversity			3			3
Social services						106
Multiple purpose				not appl.	not appl.	not appl.
No or unknown function				not appl.	not appl.	not appl.
Total – Other wooded land			106	not appl.	not appl.	not appl.

3.5 Comments to National reporting table T3

As wood harvesting is forbidden in Lebanon, the main forest product is the pine nuts from the *Pinus pinea* forests. Other non-wood forest products, like oregano, sage, honey, carob pods and even charcoal are extracted from the forests and other wooded lands. In addition to being productive, forests and OWL play all the functions of protection of soil and water and social services. The protected forests and reserves play a multiple function as well, since they cover services such as social services, conservation and biodiversity and protection of soil and water.

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
National Forest and Tree Resources Assessment and Monitoring (FAO, TCP/LEB/2903)	H	Characteristics of forests and OWL	2004	

4.2.2 Classification and definitions

National class	Definition
Modified natural	Same as FRA
Productive plantation	Same as FRA

4.2.3 Original data

The National Forest and Tree Resources Assessment and Monitoring (FAO, TCP/LEB/2903) provides data about the area of the different conifers species and the broadleaves. Considering that the *Pinus pinea* forests are all planted with the objective of production of pine nuts, the original data can therefore be used to calculate the area of production forests.

Area of *Pinus pinea*: 7 943ha.

4.3 Analysis and processing of national data

4.3.1 Calibration

The area is multiplied by the calibration factor: 0.9790354. The calibrated area of *Pinus pinea* is 7 776 ha.

4.3.2 Estimation and forecasting

The data for 2004 have been used for the reporting year 2005. No data are available for 1990 and 2000.

4.4 Reclassification into FRA 2005 classes

With the exception of the *Pinus pinea* forests that were planted more than 70 years ago with the objective of the pine nut production, all forests and other wooded lands are considered as modified natural since they all show signs of past or recent human interventions.

4.5 Data for National reporting table T4

FRA 2005 Categories	Area (1000 hectares)					
	Forest			Other wooded land		
	1990	2000	2005	1990	2000	2005
Primary	ID	ID	0	ID	ID	0
Modified natural	ID	ID	128.7	ID	ID	106
Semi-natural	ID	ID	0	ID	ID	0
Productive plantation	ID	ID	7.8	ID	ID	0
Protective plantation	ID	ID	0	ID	ID	0
TOTAL			136.5			106

4.6 Comments to National reporting table T4

With the exception of the *Pinus pinea* forests that were planted more than 70 years ago with the objective of the pine nut production, all forests and other wooded lands are considered as modified natural since they all show signs of past or recent human interventions.

The Ministry of Environment is currently undertaking a large reforestation/afforestation program in the different parts of the country. Only native species are used.

The Ministry of Agriculture is undertaking an afforestation program on the Eastern slopes of the Western chain (the Anti-Lebanon Chain). The last reforestation/afforestation campaigns that the Ministry of Agriculture had undertaken go back to the early 1970's, prior to the Lebanese war. At that time, native species were mainly used. No precise data are currently available on these plantations. Information on the plantations undertaken by both ministries will be provided in the next reporting exercise.

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
National Forest and Tree Resources Assessment and Monitoring (FAO, TCP/LEB/2903)	H	Volume	2004	

5.2.2 Classification and definitions

National class	Definition
Growing stock	Volume over bark of all living trees more than 10 cm in diameter at breast height (or above buttress if these are higher). Includes the stem from ground level or stump height up to top of bole.

5.2.3 Original data

The national forest assessment gives the following data for 2004

Land Use	Volume (m ³ /ha)
Forest	35.6
Other Wooded Lands	5.1
Other Lands	3.7
Total	

Note: The following form factors were used to calculate the volume of the tree trunks. Default values of 0.5 for broadleaves, 0.7 for conifers and 0.55 for fruit trees.

5.3 Analysis and processing of national data

The volume/ha figures were multiplied by the calibrated area figures from table T1. The data for 2004 have been used for the reporting year 2005. No data are available for 1990 and 2000.

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	NA	NA	4.858	NA	NA	0.541
Commercial growing stock	NA	NA	NA	NA	NA	NA

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	0	To the top of bole
3. Minimum diameter of branches included in Growing stock (W)	cm		Branches not included in
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	AS	
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		

5.5 Comments to National reporting table T5

No value is given for the commercial growing stock as timber harvesting is currently forbidden in Lebanon. Wood is only used as fuel and charcoal.

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/Forests department	M	BEF, R, dead-live ratio and litter carbon stock	2004	
FAO. Working Paper 81. 2004.FAO/ Forests department	H	BEF, R, dead-live ratio and litter carbon stock	2004	
National Forest and Tree Resources Assessment and Monitoring (FAO, TCP/LEB/2903)	H	Growing stock	2004	

6.2.2 Classification and definitions

National class	Definition
Above-ground biomass	Same as FRA
Below-ground biomass	Same as FRA
Dead wood biomass	Same as FRA

6.2.3 Original data

The original data on growing stock provided in the following tables refer to reference year 2004.

Growing stock of Forest by individual species

Species	GS (million m ³)
<i>Quercus cerris</i>	0.96
<i>Pinus pinea</i>	1.55
<i>Pinus brutia</i>	1.3
<i>Cedrus libani</i>	0.31
<i>Juniperus excelsa</i>	0.29
<i>Juniperus drupacea</i>	0.09
<i>Quercus infectoria</i>	0.186
<i>Quercus calliprinos</i>	0.177
<i>Ostrya carpinifolia</i>	0.016
<i>Platanus orientalis</i>	0.019
Other species	0.06
Total	4.967

Growing stock of Other Wooded Land by individual species

Species	GS (million m ³)
<i>Juniperus excelsa</i>	0.32
<i>Quercus calliprinos</i>	0.1
<i>Pinus brutia</i>	0.05
<i>Pinus pinea</i>	0.02
<i>Pyrus syriaca</i>	0.01
<i>Populus alba</i>	0.01
<i>Quercus infectoria</i>	0.01
<i>Prunus amygdalis</i>	0.006
<i>Prunus ursina</i>	0.006
Other species	0.12
Total	0.544

6.3 Analysis and processing of national data

Based on the FAO guidelines, the value of the wood density factor (WD) is 0.4 for the conifers and 0.5 for the broadleaves except for the species mentioned in the appendix 2 (0.58 for oaks). The value of 1.3 for the conifers and 1.4 for the broadleaves is used for the Biomass Expansion Factor (BEF). As in Lebanon the forest is considered as subtropical dry, the root/shoot ratio is 0.27.

Applying these conversion factor to the species-wise data on growing stock above, gives the following summary table:

Land Use	AGB (million tonnes)	BGB (million tonnes)	Total Living Biomass (million tonnes)
Forest	2.793	0.797	3.59
OWL	0.325	0.082	0.407

6.3.1 Calibration

The values in the table above are multiplied by the calibration factor 0.9790354 which gives the following calibrated values for 2004.

Land Use	AGB (million tonnes)	BGB (million tonnes)	Total Living Biomass (million tonnes)
Forest	2.734	0.780	3.515
OWL	0.318	0.080	0.398

6.3.2 Estimation and forecasting

The data for 2004 have been used for the reporting year 2005. No data are available for 1990 and 2000.

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	NA	NA	2.734	NA	NA	0.318
Below-ground biomass	NA	NA	0.780	NA	NA	0.080
Dead wood biomass	NA	NA	NA	NA	NA	NA
TOTAL	NA	NA	3.515	NA	NA	0.398

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	H	BEF, R, dead-live ratio and litter carbon stock	2004	
National Forest and Tree Resources Assessment and Monitoring (FAO, TCP/LEB/2903)	H	Growing stock	2004	

7.2.2 Classification and definitions

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

7.2.3 Original data

Data from table T6 was used as input for this reporting table

7.3 Analysis and processing of national data

The calculation of the carbon stock is based on the biomass data. It is calculated by multiplying respectively the above-ground biomass and the below-ground biomass from table T6 by the default value for carbon content in living biomass (50% = 0.5 ton carbon per ton dry weight)

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			1.367			0.159
Carbon in below-ground biomass			0.390			0.040
Sub-total: Carbon in living biomass			1.757			0.199
Carbon in dead wood						
Carbon in litter						
Sub-total: Carbon in dead wood and litter						
Soil carbon to a depth of _____ cm						
TOTAL CARBON			1.757			0.199

8 Table T8 – Disturbances affecting health and vitality

8.1 FRA 2005 Categories and definitions

Category	Definition
Disturbance by fire	Disturbance caused by wildfire, independently whether it broke out inside or outside the forest/OWL.
Disturbance by insects	Disturbance caused by insect pests that are detrimental to tree health.
Disturbance by diseases	Disturbance caused by diseases attributable to pathogens, such as a bacteria, fungi, phytoplasma or virus.
Other disturbance	Disturbance caused by other factors than fire, insects or diseases.

8.2 National data

8.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
National Forest and Tree Resources Assessment and Monitoring (FAO, TCP/LEB/2903)	H	Levels of disturbances by fire, insects, diseases and other	2004	

8.2.2 Classification and definitions

National class	Definition
Disturbance by fire	Same as FRA

8.2.3 Original data

The data provided by the National Forest and Tree Resources Assessment and Monitoring (FAO, TCP/LEB/2903) could not be used for the purposes of this report, as it refers to levels of disturbances by number of trees affected. The only data that was used is that referring to forest fires in forests: 19,652 ha of forests disturbed by fire.

8.3 Analysis and processing of national data

8.3.1 Calibration

The values are multiplied by the calibration factor: 0.9790354

8.3.2 Estimation and forecasting

The data for 2004 have been used for the reporting year 2000. No data are available for 1990.

8.4 Data for National reporting table T8

FRA-2005 Categories	Average annual area affected (1000 hectares)			
	Forests		Other wooded land	
	1990	2000	1990	2000
Disturbance by fire	NA	19.2	NA	NA
Disturbance by insects	NA	NA	NA	NA
Disturbance by diseases	NA	NA	NA	NA
Other disturbance	NA	NA	NA	NA

8.5 Comments to National reporting table T8

The information provided by the data collected during the assessment exercise refers to the overall level of disturbances to the forests. Forests are classified as slightly, moderately or heavily disturbed. No reference is made on the type of disturbance and on its extent. The only available data is that concerning forests affected by fire. However the level or degree of affection is not available.

The proliferation of forest pests has over the past years caused extensive damage to several forests. For example, several species of pests, including the harmful pine processionary moth, have infested pine forests, and a previously unknown insect has infested and devastated cedar forests in Tannourine and Hadath El Jebbe (one of the largest cedar forests in Lebanon). This insect was later named after the forest where it was first identified, *Cephalcia tannourinensis n.sp.*

The table below presents a tentative list of the most harmful pests that have infested several forests in Lebanon. While most of these pests have perhaps always existed, an apparent rise in populations in recent years calls for an intensification of research and monitoring. Despite the quality of the information provided in the table below, it cannot be utilized for our report as it does not refer to any surface area affected by the insect attack.

<i>Forest Type</i>	<i>Pests</i>	<i>Management Status</i>
Stone (umbrella) pine	<i>Ernobius sp.</i> , <i>Chalcophora detrita</i> , <i>Phytoecia sp.</i> , <i>Pitophorus pubescens</i> , <i>Tomicus piniperda</i>	These insects attack weak trees. Best technique is to remove all dead trees and twigs, which are the primary niches for infestation outbreaks
Aleppo and brutia pine	Moth (pine processionary), <i>Thaumetopoea wilkinsoni</i>	Using helicopters, the Lebanese Army and MoA have sprayed the biological insecticide <i>Bacillus thuringiensis</i> between September and November, depending on altitude since 1999. New specific insecticides will be tried in 2005
Cedar of Lebanon	Sawfly, <i>Cephalcia tannourinensis</i>	Four aerial spraying cycles have been conducted between 1999 and 2002, using Difluobenzuron (an insect growth regulator)
Oak	Moth (gypsy moth), <i>Lymantria dispar</i> and the processionary moth	No control, attacks are tolerable

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
National Forest and Tree Resources Assessment and Monitoring (FAO, TCP/LEB/2903)	H	Number of tree species	2004	

9.2.2 Classification and definitions

National class	Definition
Native tree species	Same as FRA

9.2.3 Original data

List of native tree species:

Abies cilicica
Acer monspessulanum var. *hermoneum*
Acer syriaca
Acer tauricululum
Alnus orientalis
Arbutus andrachne
Cedrus libani
Celtis australis
Ceratonia siliqua
Cercis siliquastrum
Cupressus sempervirens
Ficus sycomorus
Fraxinus ornus
Fraxinus syriacum

Juglans regia
Juniperus drupacea

Juniperus excelsa
Laurus nobilis
Malus trilobata
Ostrya carpinifolia
Pinus brutia
Pinus halepensis
Pinus pinea
Platanus orientalis
Populus alba
Populus nigra
Populus tremula
Prunus ursina

Pyrus syriaca
Pyrus syriaca var. *boveri*

Quercus brantii ssp. *Look*
Quercus calliprinos
Quercus cedrorum
Quercus cerris var. *pseudocerris*
Quercus infectoria
Quercus ithaburensis ungeri
Quercus microphylla
Quercus pinnatifida
Sorbus flabellifolia
Sorbus torminalis var. *pinnatifida*
Styrax officinalis

9.3 Data for National reporting table T9

FRA 2005 Categories	Number of species (year 2000)
Native tree species	41
Critically endangered tree species	0
Endangered tree species	0
Vulnerable tree species	0

10 Table T10 – Growing stock composition

10.1 FRA 2005 Categories and definitions

List of species names (scientific names) of the ten most common species.

<i>Quercus cerris</i>
<i>Pinus pinea</i>
<i>Pinus brutia</i>
<i>Cedrus libani</i>
<i>Juniperus excelsa</i>
<i>Juniperus drupacea</i>
<i>Quercus infectoria</i>
<i>Quercus calliprinos</i>
<i>Ostrya carpinifolia</i>
<i>Platanus orientalis</i>

10.2 National data

10.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
National Forest and Tree Resources Assessment and Monitoring (FAO, TCP/LEB/2903)	H	Growing stock of tree species	2004	

10.2.2 Original data

The Growing stock in 2004 of the 10 most common species :

Species	GS (million m ³)
<i>Quercus cerris</i>	0.96
<i>Pinus pinea</i>	1.55
<i>Pinus brutia</i>	1.30
<i>Cedrus libani</i>	0.31
<i>Juniperus excelsa</i>	0.29
<i>Juniperus drupacea</i>	0.09
<i>Quercus infectoria</i>	0.186
<i>Quercus calliprinos</i>	0.177
<i>Ostrya carpinifolia</i>	0.016
<i>Platanus orientalis</i>	0.019
Other species	0.060
Total	4.967

10.3 Analysis and processing of national data

10.3.1 Calibration

The values are multiplied by the calibration factor: 0.9790354

10.3.2 Estimation and forecasting

The data for 2004 have been used for the reporting year 2000. No data are available for 1990.

10.4 Data for National reporting table T10

FRA 2005 Categories / Species name	Growing Stock in Forests (million cubic meters)	
	1990	2000
<i>Pinus pinea</i>	ID	1.518
<i>Pinus brutia</i>	ID	1.273
<i>Quercus cerris</i>	ID	0.940
<i>Cedrus libani</i>	ID	0.304
<i>Juniperus excelsa</i>	ID	0.284
<i>Quercus infectoria</i>	ID	0.182
<i>Quercus calliprinos</i>	ID	0.173
<i>Juniperus drupacea</i>	ID	0.088
<i>Platanus orientalis</i>	ID	0.019
<i>Ostrya carpinifolia</i>	ID	0.016
Other species	ID	0.059
TOTAL	ID	4.854

11 Table T11 – Wood removal

11.1 FRA 2005 Categories and definitions

Category	Definition
Industrial wood removal	The wood removed (volume of round-wood over bark) for production of goods and services other than energy production (woodfuel).
Woodfuel removal	The wood removed for energy production purposes, regardless whether for industrial, commercial or domestic use.

11.2 National data

No data is available as wood harvesting is banned by law. A recent amendment of the legislation is now allowing the harvesting of wood for the production of charcoal. However, this amendment is too recent to be captured by any data source.

11.3 Data for National reporting table T11

FRA 2005 Categories	Volume in 1000 cubic meters of roundwood over bark					
	Forest			Other wooded land		
	1990	2000	2005	1990	2000	2005
Industrial roundwood	0	0	0	0	0	0
Woodfuel	0	0	ID	0	0	ID
TOTAL for Country	0	0	ID	0	0	ID

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

No data is available as wood harvesting is banned by law. A recent amendment of the legislation is now allowing the harvesting of wood for the production of charcoal. However, this amendment is too recent to be captured by any data source.

12.3 Data for National reporting table T12

FRA 2005 Categories	Value of roundwood removal (1000 USD)					
	Forest			Other wooded land		
	1990	2000	2005	1990	2000	2005
Industrial roundwood	0	0	0	0	0	0
Woodfuel	0	0	ID	0	0	ID
TOTAL for Country	0	0	ID	0	0	ID

13 Table T13 – Non-wood forest product removal

13.1 FRA 2005 Categories and definitions

The following categories of non-wood forest products have been defined:

Category
<u>Plant products / raw material</u>
1. Food
2. Fodder
3. Raw material for medicine and aromatic products
4. Raw material for colorants and dyes
5. Raw material for utensils, handicrafts & construction
6. Ornamental plants
7. Exudates
8. Other plant products
<u>Animal products / raw material</u>
9. Living animals
10. Hides, skins and trophies
11. Wild honey and bee-wax
12. Bush meat
13. Raw material for medicine
14. Raw material for colorants
15. Other edible animal products
16. Other non-edible animal products

13.2 National data

Several NWFP are exploited, mainly pine nuts from the *Pinus pinea*, oregano, sage, laurel leaves, carob pods and several aromatic, medicinal and culinary species. The only available data concerns the amount of pine nuts produced every year. The data source is an oral communication by a researcher from the National Centre for Remote Sensing. Honey is also produced, however the available data covers all honey produced in Lebanon, in forests, OWL, orchards and gardens.

13.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Oral communication	M	Amount of pine nuts produced	2004	

13.2.2 Classification and definitions

Same as FRA

13.2.3 Original data

70 tonnes of pine nuts/year

13.3 Analysis and processing of national data

The data for 2004 have been used for the reporting year 2005. No data are available for 1990 and 2000.

13.4 Data for National reporting table T13

FRA 2005 Categories	Scale factor	Unit	NWFP removal		
			1990	2000	2005
<u>Plant products / raw material</u>					
1. Food (Pine nuts)		ton			70
2. Fodder	ID	ID	ID	ID	ID
3. Raw material for medicine and aromatic products	ID	ID	ID	ID	ID
4. Raw material for colorants and dyes	ID	ID	ID	ID	ID
5. Raw material for utensils, handicrafts & construction	ID	ID	ID	ID	ID
6. Ornamental plants	ID	ID	ID	ID	ID
7. Exudates	ID	ID	ID	ID	ID
8. Other plant products	ID	ID	ID	ID	ID
	ID	ID	ID	ID	ID
<u>Animal products / raw material</u>	ID	ID	ID	ID	ID
9. Living animals	ID	ID	ID	ID	ID
10. Hides, skins and trophies	ID	ID	ID	ID	ID
11. Wild honey and bee-wax	ID	ID	ID	ID	ID
12. Bush meat	ID	ID	ID	ID	ID
13. Raw material for medicine	ID	ID	ID	ID	ID
14. Raw material for colorants	ID	ID	ID	ID	ID
15. Other edible animal products	ID	ID	ID	ID	ID
16. Other non-edible animal products	ID	ID	ID	ID	ID

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

14.1 FRA 2005 Categories and definitions

The following categories of non-wood forest products have been defined:

Category
<u>Plant products / raw material</u>
1. Food
2. Fodder
3. Raw material for medicine and aromatic products
4. Raw material for colorants and dyes
5. Raw material for utensils, handicrafts & construction
6. Ornamental plants
7. Exudates
8. Other plant products
<u>Animal products / raw material</u>
9. Living animals
10. Hides, skins and trophies
11. Wild honey and bee-wax
12. Bush meat
13. Raw material for medicine
14. Raw material for colorants
15. Other edible animal products
16. Other non-edible animal products

14.2 National data

14.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Market price	M	Price of pine nuts	2004	

14.2.2 Classification and definitions

Same as FRA

14.2.3 Original data

The retail value of 1 kilogramme of pine nuts is 25 USD.
 $70\,000 \times 25 = 1\,750\,000$ USD

14.3 Analysis and processing of national data

The data for 2004 have been used for the reporting year 2005. No data are available for 1990 and 2000.

14.4 Data for National reporting table T14

FRA 2005 Categories	Value of the of NWFP removed (1000 USD)		
	1990	2000	2005
<u>Plant products / raw material</u>			
1. Food (Pine nuts)	ID	ID	1 750
2. Fodder	ID	ID	ID
3. Raw material for medicine and aromatic products	ID	ID	ID
4. Raw material for colorants and dyes	ID	ID	ID
5. Raw material for utensils, handicrafts & construction	ID	ID	ID
6. Ornamental plants	ID	ID	ID
7. Exudates	ID	ID	ID
8. Other plant products	ID	ID	ID
	ID	ID	ID
<u>Animal products / raw material</u>	ID	ID	ID
9. Living animals	ID	ID	ID
10. Hides, skins and trophies	ID	ID	ID
11. Wild honey and bee-wax	ID	ID	ID
12. Bush meat	ID	ID	ID
13. Raw material for medicine	ID	ID	ID
14. Raw material for colorants	ID	ID	ID
15. Other edible animal products	ID	ID	ID
16. Other non-edible animal products	ID	ID	ID
TOTAL	ID	ID	1 712

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
Ministry of Agriculture	H	Total number of all levels staff	2005	

15.2.2 Classification and definitions

Same as FRA

15.2.3 Original data

175 people (Engineers, forest guards, technicians and administrative staff) are employed by the Ministry of Agriculture. Despite the restriction on employment in the Government, 75 forest guards will be recruited by June 2005. The total number of staff in 2005 would then be raised to 250 people employed in the MOA. No data is available regarding other employments, such as extraction of NWFP and ecotourism.

15.3 Data for National reporting table T15

FRA 2005 Categories	Employment (1000 person-years)	
	1990	2000
Primary production of goods	ID	ID
Provision of services	ID	0.18
Unspecified forestry activities	ID	ID
TOTAL	ID	ID

15.4 Comments to National reporting table T15

No data is currently available on the number of people working in the forests and in forest related activities. Pine nuts production constitutes the main income of several rural communities. Many NWFP are extracted and sold in local markets by local groups. Several small companies are currently working in the sector of ecotourism. Despite the ban on wood harvesting and on charcoal production, illicit harvesting and production were occurring.