Forestry Department
Food and Agriculture Organization of the United Nations

GLOBAL FOREST RESOURCES ASSESSMENT

COUNTRY REPORTS

SWAZILAND

FRA2005/214
Rome, 2005

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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Report preparation and contact person

No official report has been received from Swaziland.

This report is the result of a desk study prepared by the FRA 2005 secretariat in Rome, which summarizes existing available information using the established format for FRA 2005 country reports.

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
Thurland, M.. 1999. Forest Resource Assessment 1999. Forest Policy and Legislation Project, DANCED/ MOAC/ FS	H	Definition and Land use cover	1990 1999	Primary data source
FAOSTAT	H	Total land area		Secondary data source

1.2.2 Classification and definitions

National classes	Definition
Montane and Highland	Indigenous forest. >900m, Afromontane and mixed woodland, >10% canopy cover, Highveld/upper Middleveld
Riparian	Indigenous forest. Mixed woodland occuring along rivers, all physiographic zones.
Moister Savannah	Indigenous forest. 400-800m, mainly broadleaved mixed woodland, >10% canopy cover, Middleveld/Lubombo range.
Acacia Savannah	Indigenous forest. 200-400m, Acacia dominated woodland, >10% canopy cover, Lowveld.
Dryer Acacia Savannah	>10% canopy cover, >5m canopy height, (East) Lowveld, precipitation <600mm.
Bushveld	Indigenous forest. 200-400m, bush/thicket communities, >10% canopy cover, <5m canopy height, Lowveld to Highveld.
Wattle Forest	Man-made Forest. Highveld, A. maernsii dominated forests.
Plantation	Man-made Forest. Man-made plantations of pines and eucalypts(mainly highveld).

1.2.3 Original data

FAOSTAT	
Total Country Area	1736
Inland water	16
Total land area	1720

1990 and 1999

National Classes	1990	1999
Montane and Highland	11 930	15 765
Riparian	2 344	25 997
Moister Savannah	112 720	104 273
Acacia Savannah	150 590	180 546
Dryer Acacia Savannah	34 025	35 125
Bushveld	151 890	275 705
Wattle Forest	25 439	28 839
Plantation	135 034	122 596
Total	**623 972**	**788 846**

1.3 Analysis and processing of national data

1.3.1 Calibration

Not needed.

1.3.2 Estimation and forecasting

This is done through linear extrapolation after reclassification.

1.4 Reclassification into FRA 2005 classes

	FRA Classification	
National Classes	Forest	Other wooded land
Montane and Highland	100%	
Riparian	100%	
Moister Savannah	100%	
Acacia Savannah	100%	
Dryer Acacia Savannah	100%	
Bushveld		100%
Wattle Forest	100%	
Plantation	100%	

After reclassification we have the following table:

FRA 2005 Categories	**Area (hectares)**	
	1990	**1999**
Forest	472 082	513 141
Other wooded land	151 890	275 705

The estimates for 1990 are used directly and those for 2000 and 2005 obtained through linear extrapolation.

FRA 2005 Categories	**Area (hectares)**			
	1990	***1999***	**2000**	**2005**
Forest	*472 082*	*513 141*	517 703	540 514
Other wooded land	*151 890*	*275 705*	289 462	358 248

1.5 Data for National reporting table T1

FRA 2005 Categories	**Area (1000 hectares)**		
	1990	**2000**	**2005**
Forest	472	518	541
Other wooded land	152	276	289
Other land	1 096	927	890
...of which with tree cover [1)]	NDA	NDA	NDA
Inland water bodies	16	16	16
TOTAL	**1 736**	**1 736**	**1 736**

1.6 Comments to National reporting table T1

Dryer Acacia Savannah which was considered to be “other wooded land”in the FRA 2000 report, has been reclassified as “forest” in this report. This is because its definition clearly states that it is above 5 m tall and has a canopy cover greater than 10%.

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
Menne, W. 2004. Timber Plantations in Swaziland. TimberWatch Coalition, 46p. http://www.wrm.org.uy/countries/Swaziland/Plantations.pdf	H	Private ownership	2004	Secondary data source.

2.2.2 Original data

Three private companies own 101 000 ha of plantations

2.3 Analysis and processing of national data

No information has been identified on the ownership of the rest of the forests and of the other wooded land.

2.4 Data for National reporting table T2

FRA 2005 Categories	Area (1000 hectares)			
	Forest		Other wooded land	
	1990	2000	1990	2000
Private ownership	ID	ID	NDA	NDA
Public ownership	NDA	NDA	NDA	NDA
Other ownership	NDA	NDA	NDA	NDA
TOTAL	**472**	**518**	**152**	**276**

2.5 Comments to National reporting table T2

Three private companies own an estimated 101 000 ha of plantations. No information has been identified on the ownership of the rest of the forests and of the other wooded land.

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
Thurland, M., 1999. Forest Resource Assessment 1999. Forest Policy and Legislation Project, DANCED/ MOAC/ FS	H	Plantation area	1990 1999	Primary data source

3.2.2 Classification and definitions

National classes	Definition
Wattle Forest	Man-made Forest. Highveld, A. maernsii dominated forests.
Plantation	Man-made Forest. Man-made plantations of pines and eucalypts (mainly highveld).

3.2.3 Original data

National Classes	1990 (ha)	1999 (ha)
Wattle Forest	25 439	28 839
Plantation	135 034	122 596
Total Forests and OWL	**623 972**	**788 846**

3.3 Analysis and processing of national data

3.3.1 Estimation and forecasting

The plantation and wattles forest areas have been estimated by linear extrapolation:

National Classes	*1990(ha)*	*1999 (ha)*	2000 (ha)	2005 (ha)
Wattle Forest	*25 439*	*28 839*	29 217	31 106
Plantation	*135 034*	*122 596*	121 214	114 304
Total	***160 473***	***151 435***	**150 431**	**145 410**

3.4 Reclassification into FRA 2005 classes

Assumptions:
1. Plantation areas and wattle forest areas are designated for production purposes.
2. The rest unknown

3.5 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	160	150	145			
Protection of soil and water						
Conservation of biodiversity						
Social services						
Multiple purpose				not appl.	not appl.	not appl.
No or unknown function	312	367	395	not appl.	not appl.	not appl.
Total - Forest	**472**	**518**	**541**	**not appl.**	**not appl.**	**not appl.**
Other wooded land						
Production	NDA	NDA	NDA			
Protection of soil and water	NDA	NDA	NDA			
Conservation of biodiversity	NDA	NDA	NDA			
Social services	NDA	NDA	NDA			
Multiple purpose	NDA	NDA	NDA	not appl.	not appl.	not appl.
No or unknown function	NDA	NDA	NDA	not appl.	not appl.	not appl.
Total – Other wooded land	**152**	**276**	**289**	**not appl.**	**not appl.**	**not appl.**

3.6 Comments to National reporting table T9

No information is available for other wooded land.

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 Original data

From T1

4.3 Analysis and processing of national data

The plantation and wattle forest areas have been estimated by linear extrapolation.

4.4 Reclassification into FRA 2005 classes

Plantation area = 100% productive plantation
Wattle forest = 100% semi-natural
Remaining forest = 100% modified natural

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						
Modified natural	312	367	395	152	276	289
Semi-natural	25	29.2	31.1			
Productive plantation	135	121	114			
Protective plantation						
TOTAL	**472**	**518**	**541**	**152**	**276**	**289**

4.6 Comments to National reporting table T9

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
Thurland, M., 1999. Forest Resource Assessment 1999. Forest Policy and Legislation Project, DANCED/ MOAC/ FS	H	Volume per hectare, Total volume	1990, 1999	Primary data source

5.2.2 Original data

1999

National Classes	Area (ha)	Volume/hectare (m3/ha)	Total volume (m3)
Montane and Highland	15 765	14.2	223 863
Riparian	25 997	37.8	982 687
Moister Savannah	104 273	18.5	1 929 051
Acacia Savannah	180 546	16.4	2 960 954
Dryer Acacia Savannah	35 125	16.2	569 025
Wattle Forest	28 839	16.4	472 960
Total	**666 250**	**18.3**	**7 138 539**

Bushveld	275 705	11.7	3 224 912

According to expert estimates, the volume per hectare in plantations is 100 m3/ha.

5.3 Analysis and processing of national data

On re-arranging the above data, we get the table below:

Category	**m3/ha**
Forests excl. plantations	18.3
Forest plantations	100
Other Wooded land	11.7

Applying the volume per hectare to the areas according to tables T1 and T4, gives the following:

	1990	**2000**	**2005**
Area of forest excl. plantations (ha)	337 000	397 000	427 000
Area of plantations (ha)	135 000	121 000	114 000
Area of Other wooded land (ha)	152 000	276 000	289 000
Volume of forest excl. plantations (1000 m3)	6 167	7 265	7 814
Volume of plantations (1000 m3)	13 500	12 100	11 400
Total volume of Forest (1000 m3)	**19 667**	**19 365**	**19 214**
Volume of Other wooded land (1000 m3)	**1 778**	**3 229**	**3 381**

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	19.7	19.4	19.2	1.8	3.2	3.4
Commercial growing stock	Id	Id	Id	Id	Id	Id

Specification of country threshold values	**Unit**	**Value**	**Complementary information**
1. Minimum diameter at breast height of trees included in Growing stock (X)	cm		
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		
6. Have any of the above thresholds (points 1 to 4) changed since 1990	Yes/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

No national biomass data are available. Growing stock data from table T5 used as input.

6.3 Analysis and processing of national data

The following conversion factors were used

Wood density	0.58
BEF	3.4
R/S ratio	0.24

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	38.8	38.3	37.9	3.5	6.3	6.7
Below-ground biomass	9.3	9.2	9.1	0.9	1.5	1.6
Dead wood biomass						
TOTAL	**48.2**	**47.4**	**46.9**	**4.4**	**7.8**	**8.3**

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

Data from table T6 were used as input.

7.3 Analysis and processing of national data

A carbon content of 50% was applied to the biomass data from table T6.

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	19.4	19.1	18.9	1.8	3.2	3.4
Carbon in below-ground biomass	4.7	4.6	4.5	0.4	0.8	0.8
Sub-total: Carbon in living biomass	**24.1**	**23.7**	**23.5**	**2.2**	**3.9**	**4.2**
Carbon in dead wood						
Carbon in litter						
Sub-total: Carbon in dead wood and litter						
Soil carbon to a depth of _____ cm						
TOTAL CARBON						

8 Table T8 – Disturbances affecting health and vitality

No data available

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
IUCN Redlist www.iucn.org	M	Critically endangered tree species, Endangered tree species, Vulnerable tree species	2000	

9.2.2 Original data

Critically endangered tree species	*Encephalartos heenanii* *Encephalartos laevifolius*
Endangered tree species	*Encephalartos lebomboensis* *Warburgia salutaris*
Vulnerable tree species	*Encephalartos aplanatus* *Encephalartos ngoyanus* *Encephalartos paucidentatus* *Encephalartos senticosus* *Encephalartos umbeluziensis* *Ocotea kenyensis* *Prunus africana*

9.3 Data for National reporting table T9

FRA 2005 Categories	**Number of species (year 2000)**
Native tree species	NDA
Critically endangered tree species	2
Endangered tree species	2
Vulnerable tree species	7

9.4 Comments to National reporting table T9

Critically endangered tree species	*Encephalartos heenanii* *Encephalartos laevifolius*
Endangered tree species	*Encephalartos lebomboensis* *Warburgia salutaris*
Vulnerable tree species	*Encephalartos aplanatus* *Encephalartos ngoyanus* *Encephalartos paucidentatus* *Encephalartos senticosus* *Encephalartos umbeluziensis* *Ocotea kenyensis* *Prunus africana*

10 Table T10 – Growing stock composition

No data available

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).
Woodfuel 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
FAOSTAT	M	Roundwood production, Wood fuel production	1988-2002	Secondary data source

11.2.2 Original data

Industrial roundwood production (m^3 under bark)								
1988	**1989**	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**
1 221 000	975 000	964 000	964 000	964 000	931 000	931 000	934 000	934 000

Industrial roundwood production (m^3 under bark)					
1997	**1998**	**1999**	**2000**	**2001**	**2002**
934 000	330 000	330 000	330 000	330 000	330 000

Wood fuel production (m^3 under bark)								
1988	**1989**	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**
560 000	560 000	560 000	560 000	560 000	560 000	560 000	560 000	560 000

Wood fuel production (m^3 under bark)					
1997	**1998**	**1999**	**2000**	**2001**	**2002**
560 000	560 000	560 000	560 000	560 000	560 000

11.3 Analysis and processing of national data

11.3.1 Estimation and forecasting

FAOSTAT gives values under bark. By multiplying these values by 1.15 we get estimates over bark.

An average value for the period 1998-2002 is used to as the estimate for year 2000. The value reported for 2002 in the original data has been used as the estimate for 2005.

This has resulted in the following table:

National Classes	**1000 m3**		
	1990	**2000**	**2005**
Industrial roundwood production	1 170	380	380
Wood fuel production	644	644	644
TOTAL	**1 814**	**1 024**	**1 024**

11.4 Reclassification into FRA 2005 classes

Industrial roundwood production = 100% Industrial wood removal

Wood fuel production = 100% Woodfuel removal

11.5 Data for National reporting table T11

	Volume in 1000 cubic meters of roundwood over bark					
FRA 2005 Categories	**Forest**			**Other wooded land**		
	1990	**2000**	**2005**	**1990**	**2000**	**2005**
Industrial roundwood	1 170	380	380			
Woodfuel	644	644	644			
TOTAL for Country	**1 814**	**1 024**	**1 024**			

11.6 Comments to National reporting table T9

FAOSTAT does not differentiate between forest and other wooded land. Data reported in Table T11 above is thus assumed to be a combination of these two classes.

12 Table T12 – Value of wood removal

No data available

13 Table T13 – Non-wood forest product removal

No data available

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

No data available

15 Table T15 – Employment in forestry

No data available