Forestry Department
Food and Agriculture Organization of the United Nations

GLOBAL FOREST RESOURCES ASSESSMENT 2010

COUNTRY REPORT

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The Forest Resources Assessment Programme

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

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

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

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The Global Forest Resources Assessment Country Report Series is designed to document and make available the information forming the basis for the FRA 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.

Contents

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1 Table T1 – Extent of Forest and Other wooded land

1.1 FRA 2010 Categories and definitions

Category	Definition
Forest	Land spanning more than 0.5 hectares with trees higher than 5 meters and a canopy cover of more than 10 percent, or trees able to reach these thresholds *in situ*. It does not include land that is predominantly under agricultural or urban land use.
Other wooded land	Land not classified as "Forest", spanning more than 0.5 hectares; with trees higher than 5 meters and a canopy cover of 5-10 percent, or trees able to reach these thresholds *in situ*; or with a combined cover of shrubs, bushes and trees above 10 percent. It does not include land that is predominantly under agricultural or urban land use.
Other land	All land that is not classified as "Forest" or "Other wooded land".
Other land with tree cover (Subordinated to "Other land")	Land classified as "Other land", spanning more than 0.5 hectares with a canopy cover of more than 10 percent of trees able to reach a height of 5 meters at maturity.
Inland water bodies	Inland water bodies generally include major rivers, lakes and water reservoirs.

1.2 National data

1.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Millington, A., and Towsend, J. (eds.) 1989. Biomass assessment. Woody biomass in the SADC region. Earthscan Publication Ltd. London. UK	H	Definition and Land use cover	1985	
Kwesha, D. & Dreiser, D. 1997, Vegetation mapping in Zimbabwe – VEGRIS		Land use types	1992	

1.2.2 Classification and definitions

The classification system for 1985 data (Millington and Towsend (1989)) is different from the classification system used for the visual interpretation and mapping of land cover from Landsat 5 satellite imagery for the 1992 data by **Kwesha, D. & Dreiser, D. 1997.** Different data sets will therefore be presented, analysed and reclassified for each classification system.

Classification and definitions for the 1985 data obtained from Millington and Towsend (source 1).

Zimbabwe is divided into nine biomass classes. This division is based on the interpretation of NOAA-7 AVHRRGAC data and reference to previous botanical and forestry studies (Government of Zimbabwe, 1985).

National class	Definition
Dense Savannah Woodlands	This type of woodlands is found in moist, undisturbed conditions on well-drained soils, generally above 1 350 masl, but at slightly lower altitudes in the south. The canopy, which is dominated by *Brachystegia spiciformis and Julbernardia*, varies between 6 and 13m in height. Tree canopy cover is high, generally over 80% but the shrub and grass cover is poorly developed and open, usually below 50%. The woodlands exhibit fewer disturbances than the surroundings woodland and there are few, if any, of the grass and savannah areas that are found in the other types of savannah woodland in Zimbabwe.
Open Savannah and Baikiaea Woodland	Montane vegetation is also included in this class and is mainly found in mountainous areas along the Mozambique border, in Manicaland Province. The canopy is 6-13 m tall and is dominated by *Brachystegia spiciformis* and *Julbernardia globifl*ora. The tree canopy varies between 50-80%, shrub cover is open and is usually below 50% and grass cover ranges from 50-80%.
Seasonal Savannah Woodlands	This form of Savanna Woodland is intermediate between the open and dry phases. It occurs mainly at the edges of Open Savannah or Montane Woodland and is representative of slightly drier conditions. This is similar to the Open Savannah Woodlands and significantly higher than the Dry Savanna Woodlands. Structurally, the woodland is intermediate between the other types of Savannah Woodland. In less degraded and in moister areas the canopy trees reach 8-10m, but due to the seasonality, are more open than Open Savanna Woodlands. The canopy cover varies between about 50 and 80%, and the shrub and grass cover is relatively well developed. Shrubs and smaller trees such as *Diospyros kirkii, Faurea saligna, Protea gaguedi, Pseudolachnostylis maprouneifolia and Psosrospermum febrifugum* dominate the under-storey.
Dry Savannah Woodlands	Dry savannah occurs mainly at altitudes of between 1000 and 1300 masl, on the Highveld. Scattered amongst the canopy are smaller trees *mainly Diospysos kirkii, Faurea saligna, Protea gaguedi, pseudodolachnostylis maprouneifolia and psorospermum febrifugum*. The underlying shrub and grass layers are poorly developed. Below 1000m, the Brachystegia woodland gives way to a lower canopy woodland (7-13m) which is dominated by *Julbernardia globiflora*. Although the canopy of Dry Savanna Woodland often reaches between 10-13m, it can be restricted to as little as 3m as it becomes drier and more disturbed. If this happens, it takes the form of an open shrubby savannah. In such situations, the canopy is much disrupted, many shrubs invade and a grass layer develops of 0.6 to 1.2m in height. In theses cases, the main dominant tree is *B. boehmii* but other small trees and shrubs invade such as *B. speciformis, C. Mopane, J. globiflora, Kirkia acuminate and Sclerocarya caffra.*
Mopane Woodland and Escarpment Thicket	Mopane woodlands and Escarpment Thickets are phenologically distinct. The main difference lies in the way in which vegetation die-back commences and the rate at which it proceeds. In Mopane Woodlands die-back starts much earlier and is more steady than in dry Savannah woodlands whereas in Escarpment Thickets, it begins later than in the other thicket vegetation types. The canopy of Mopane Woodland is more open than that of the other Highveld woodlands. In fact, it is open enough to allow large-scale shrub invasion. In the north the canopy can attain heights of between 20-25m, more commonly however, it varies between 10 and 15m.Escarpment thickets occurs along the entire length of the Zambezi Escarpment in northern Zimbabwe. Its vegetation rarely reaches more than 10m and forms a dense mixtures of tree and shrub species
Dry Bushy Savanna	Dry Bushy Savannah is a very important biomass class in Southern Zimbabwe. Variation in the vegetation communities reflects both changes in soil texture and fertility, as well as disturbances. The latter can be quiet extensive, as many of these soils are quite fertile and therefore suitable for grazing or cultivation. The ecological communities range from open grassland with scattered shrubs and emergent trees, to almost continuous low scrubland. The open, grassy savannah has a low woody biomass component. This is mainly restricted to scattered emergent trees such as *Acacia* spp.,

	Dichrostachys cinera and schlerocarya caffra, all of which reach heights of about 10m. There are also scattered shrubs which vary in height from 1-3 m and dominated by *Grewia flava, Ormocarpum trichocarpum and Zizyphus mucronata.* There is a very open savannah of small trees and bushes on the escarpment overlooking the river valleys. The structure varies from dense woody stands reaching 4-8m in height, through a variety of shrubs types, to the most arid form where trees rarely exceeds 3m, and the vegetation is very open with dominant grass and fern layers. On the sandy part of the Highveld, *Terminalia* sandveld is found. The canopy in theses areas is very open, but the trees are taller than those found in the lowland valleys and on the escarpment. The tree canopy is about 8-10 m high and is underlain by a well-developed grass layer with few shrubs. Theses areas are grazed extensively and in some places show evidence of over grazing which is affecting vegetation structure.
Degraded Bushy Savannah	Within the Shashe, Tuli and Umzingwane Valleys, and to a lesser extent the Limpopo Valley, there are areas where the Dry Bushy Savannah has degraded and it now forms a very low unproductive scrub and grassland community. Some of these areas are related to settlement (e.g. Antelopes and Legion Mines, Kezi, M'phoengs and Tuli); others may either relate to wood exploitation or land clearance, or be due to natural soil and drainage factors. These areas vary in size from about 60 to 400km^2 and total 2, 380 km^2. The vegetation is floristically similar to the Dry Bushy savannah, the main differences lying in its lower annual levels of productivity. The Vegetation mainly consists of very low shrubby *C.mopane*. This is usually 2m tall, although it may reach a height of 5m. It occurs as scattered individuals among a very low shrub ground cover with few grasses.
Wooded Grassland	These are related to intensive land clearance for agricultural activity, fuelwood and timber exploitation. The largest area is found in Manicaland and Mashonaland East Provinces, between the Inyaga Mountains to the south and Shamva to the north. This part of north–east Zimbabwe has been noted as an area at risk from high soil erosion. The vegetation is generally low, shrubby thickets and bushland occurring as isolated shrubs, bushes or thickets in grassland and area of cultivation.
Intensive Commercial Agricultural land	It has a distinct phenology, which is related to crop production, patterns rather than natural vegetation growth.

1.2.3 Original data

(a). Data Category according to 1985 national definition and classification obtained from source 1.

	km^2
National Classes	**1985**
Dense Savannah Woodland	18 907
Open Savannah and *Baikiaea* Woodland	117 790
Seasonal Savannah Woodland	3 144
Dry Savannah Woodland	47 717
Mopane Woodland and Escarpment Thicket	68 565
Dry Bushy Savannah	91 656
Degraded Bushy Savannah	2 380
Wooded Grassland	6 653
Intensive Commercial Agriculture	33 918
Total land area	**390 730**

Source: Millington and Towsend =Source 1

(b). Data Category according to 1992 national definition and classification obtained from source 2.

National Classes	Area in hectares
Natural moist forest	12 166.105
Plantation	156 855.9
Woodland	20 804 480.7
Bushland	4 974 635.02
Wooded grassland	1 204 879.28
Grassland	688 688.66
Cultivation	10 742 674.1
Rock outcrop	78 645.2
Settlement	140 779.26
Total land area	38 803 804

Original data for 1992 (data source 2)

1.3 Analysis and processing of national data

1.3.1 Calibration

(a). Calibrating 1985 data

Calibration of 1985 data	Area in ha	Calibrating factor
National land area in 1985	39 073 000	
FAO land area	38 685 000	0.99007

Results after calibrating 1985 data from source 1

	Area in 1000 hectares	
National classes	**1985**	**Calibrated 1985**
Dense Savannah Woodland	1 891	1 872
Open Savannah and Baikiaea Woodland	11 779	11 662
Seasonal Savannah Woodland	314	311
Dry Savannah Woodland	4 772	4 724
Mopane Woodland and Escarpment Thicket	6 857	6 788
Dry Bushy Savannah	9 166	9 075
Degraded Bushy Savannah	238	236
Wooded Grassland	665	659
Intensive Commercial Agriculture	3 392	3 358
Total land area	**39 073**	**38 685**

(b). Calibrating 1992 data

Calibration of 1992 data	Area in ha	Calibrating factor
National land area in 1992	38 803 804	
FAO land area	38 685 000	0.99694

Results after calibrating 1992 data from source 2

National Classes	Area in hectares	Calibrated area in hectares
Natural moist forest	12 166.105	12 129
Plantation	156 855.9	156 376
Woodland	20 804 480.7	20 740 785
Bushland	4 974 635.02	4 959 404
Wooded grassland	1 204 879.28	1 201 190
Grassland	688 688.66	686 580
Cultivation	10 742 674.1	10 709 784
Rock outcrop	78 645.2	78 404
Settlement	140 779.26	140 348
Total land area	38 803 804	38 685 000

1.3.2 Reclassification into FRA 2010 categories

(a). Reclassification of national data from source 1 (1985)

It was very difficult to reclassify the 1985 data since the forest cover was not specified for all classes. Shumba (2001) classification of the forests and OWL in the paper written for the international Forestry workshop on integration of Biodiversity in national Forestry Planning Programme" titled, Biodiversity Planning Support Programme , Integrating Biodiversity into the Forestry Sector , was used as guideline to reclassify bushy Savannah, dense savannah woodland, open savannah and Baikiaea. Expert opinion was also used to reclassify other classes.

National Classes	**Forest**	**OWL**	**OL**
Dense Savannah Woodland	100%		
Open Savannah and Baikiaea Woodland	100%		
Seasonal Savannah Woodland	100%		
Dry Savannah Woodland (1)	67%	33%	
Mopane Woodland and Escarpment Thicket (2)	100%		
Dry Bushy Savannah (3)		100%	
Degraded Bushy Savannah (4)			100%
Wooded Grassland (5)			100%
Intensive Commercial Agriculture			100%

Notes:
(1). Canopy often reaches between 10 and 13m, however, it can be restricted to as little as 3m as it becomes dryer and more disturbed. If this happens, it takes on the form of an open, shrubby savannah. The reclassification of this class was allocated 67% forests and 33% owl.
2) Mopane Woodlands have a canopy that can attain heights between 20 and 25m, more commonly it varies between 10 and 15m. Escarpment Thickets has a vegetation structure that rarely reaches more than 10m and forms a dense mixture of tree and shrub species. They were considered 100% forests because the thickets are considered dense and more than 5 m.
3. It is restricted to scattered emergent trees such as Acacia sp., there is very open savannah of small trees and bushes on the escarpment overlooking valleys and on the sandy parts of the Highveld, *Terminalia* sandveld is found. The canopy in theses areas is very open. 100% OWL because of scattered trees and the presence of *Termininalia* spp.
4. The vegetation is floristically similar to the Dry Bushy Savannah, the main difference lying in its lower annual levels of productivity caused by wood exploitation or land clearance or due to natural soil and drainage factors. *C. Mopane* occurs as scattered individuals among very low shrub ground cover with few grasses.
5. Isolated shrubs bushes or thickets in grassland and area of cultivation.

Reclassification of 1985 data

National Classes	Area in hectares		
	Forests	**OWL**	**OL**
Dense Savannah Woodland	1 871 925		
Open Savanna and Baikiaea Woodland	11 662 033		
Seasonal Savannah Woodland	311 278		
Dry Savannah Woodland	3 165 292	1 559 024	
Mopane Woodland and Escarpment Thicket	6 788 414		
Dry Bushy Savannah		9 074 584	
Degraded Bushy Savannah			235 637
Wooded Grassland			658 693
Intensive Commercial Agriculture			3 358 119
Total	**23 798 942**	**10 633 609**	**4 252 449**

Results after reclassification 1985 data

FRA Categories	Area in hectares
	1985
Forests	23 798 942
OWL	10 633 609
OL	4 252 449
Total land area	38 685 000

(b). Classification and definitions for 1992 data obtained from Source2

(b) Definitions of land cover classification following **Kwesha, D. & Dreiser, D. 1997,** Vegetation mapping in Zimbabwe – VEGRIS

National class	Definition
Forest plantation	About 0.40 of Zimbabwe's land area, i.e. 156 000 hectares. Plantations are mainly of exotic species including pines (69%), eucalyptus (16%) and wattle 15%). Plantations are systematically planted and they include stands of young and mature trees established for commercial timber production, research trials, firebreaks and woodlots.
Natural moist forest	The class consists of moist evergreen and deciduous species with a canopy cover above 80 % and a tree height of more than 15 m. The forest makes up 0.03 % (11 731 hectares) of the total land area. The forest has a multi-canopy strata of upper canopy, sub-canopy and under storey of shrubs.
Woodland	About 53 % (20 725 836 ha) of the total land area. This is a broad class that can be defined as open to dense with a canopy cover 20 -80% and tree height between 5 and 15 meters. Mainly of indigenous tree species growing naturally. Associated with the miombo savannah.
Bushland	About 13 % (4 986 932 ha) of the total land area with a canopy cover 20 -80% and tree height between 1 to 5 meters. Bushland differs from woodland in terms of height. Includes thicket and scrub. The class is of indigenous trees species growing under natural or semi-natural conditions. The class often has multi-stemmed plants.
Wooded grassland	About 3 % (1 204 445 ha) of the total land area with a canopy cover between 2 – 20 % and tree height between 1 – 15 meters. The trees may be scattered or found in clumps.
Grassland	The class covers 1.76 % (688 254) of the total land area. Trees in this class are very scattered or virtually absent**.** Class includes wetlands that are seasonally or annually waterlogged. Tree cover canopy < 2%

Cultivated land	This refers to land where the major land use is agriculture. The class covers 27. 47 % (10 742 239 ha) of the total land area. Included in this class are tea, coffee, banana and sugar plantations and orchards. There may be scattered trees in fields, field boundaries, around gardens and homesteads.
Rock outcrop	The class covers 0.2 % (78 211 ha) of the total land area and is devoid of trees.
Settlements	Areas of human habitation, most urban areas
Water body	The class includes large rivers, permanent pans, natural or man made lakes and dams and covers 0.77 % (301 111 ha).

Reclassification of 1992 data into FRA classes

National Classes	Forest	OWL	OL
Natural moist forest	100%		
Plantation	100%		
Woodland	100%		
Bushland		100%	
Wooded grassland	50%	40%	10%
Grassland			100%
Cultivation			100%
Rock outcrop			100%
Water body			
Settlement			100%

Notes:
[1]Wooded grassland (cover classes 2-20%) and height 1-15 m) was allocated to more than one class because the canopy cover and tree height cover all three classes. Note that this definition differs from the one in source 1.

Results after reclassifying 1992 data

National Classes	Area in hectares		
	Forest	OWL	OL
Natural moist forest	12 129		
Plantation	156 376		
Woodland	20 740 785		
Bushland		4 959 404	
Wooded grassland	600 595	480 476	120 119
Grassland			686 580
Cultivation			10 709 784
Rock outcrop			78 404
Settlement			140 348
Total area	21 509 885	5 439 880	11 735 235

1.3.3 Estimation and forecasting

FRA Categories	Area in hectares					
	1985	**1992**	**1990**	**2000**	**2005**	**2010**
Forests (1)	23 798 942	21 509 885	22 163 901	18 893 821	17 258 781	15 623 741
OWL (2)	10 633 608	5 439 880	0	0	0	0
OL	4 252 449	11 735 235	16 521 099	19 791 179	21 426 219	23 061 259
Total land area	38 685 000	38 685 000	38 685 000	38 685 000	38 685 000	38 685 000

Notes:
1. Forest area, 1990, 2000, 2005 and 2010, determined through linear interpolation and extrapolation.
2. Based on the two source data (1985 and 1992), it is not possible to do trend analysis for OWL. Consequently, the assumption is made that the OWL area automatically falls within Other Land category for the reporting years of 1990, 2000, 2005 and 2010.

1.4 Data for Table T1

FRA 2010 categories	Area (1000 hectares)			
	1990	**2000**	**2005**	**2010**
Forest	22 164	18 894	17 259	15 624
Other wooded land	0	0	0	0
Other land	16 521	19 791	21 426	23 061
...of which with tree cover	n/a	n/a	n/a	n/a
Inland water bodies	391	391	391	391
TOTAL	**39 076**	**39 076**	**39 076**	**39 076**

1.5 Comments to Table T1

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Forest	The difference in the areas recorded in FRA 2005 and FRA 2010 is due to the fact that the actual Total land area documented in the report by Kwesha, D. And Dreiser, D. (1997) is **38 803 804ha** and not **38 841 875ha** as shown in the 2005 report. In the FRA 2000 report, 67% of the area under woodlands from source 2 (1992 data) was allocated to forests and one-third to other wooded land. FRA 2010, however, allocated the total area to forests in accordance with the definition of this class (canopy cover 20-80%, tree height 5-15m).	The forest cover change between 1990 and 2000 is about 327 008 ha per year or 1.5 % loss per year with that for the period between 2000 and 2005 being 163 504ha or 1.7% (i.e. an increase of 0.2 % /year). The Forest area between 2000 and 2010, though, may need to be adjusted due to deforestation on large-scale commercial farms and some designated state lands due to the land reform programme. By end of 2003, an estimated 11 million ha of the commercial farms had been resettled. Cover change on these farms has not been estimated but it can be assumed that between 2000 and 2003 the deforestation rate may have increased by an 0.1% to 1.6% per annum.

Other wooded land	Based on the two source data (1985 and 1992), it is not possible to do trend analysis for OWL. Consequently, the assumption is made that the OWL area automatically falls within Other Land category for the reporting years of 1990, 2000, 2005 and 2010. It could be noted that OWL area in 1990 might well exceed 5 millions ha.	
Other land		
Other land with tree cover	No data was available to report on this field as the available source data could not be broken down enough to come up with good estimates.	
Inland water bodies		There are also chances that the area of inland water bodies increased within the same period due to increased investment in dam construction.

Other general comments to the table
According to Shumba (2001), the only national survey on deforestation that involved a comparative analysis of woodland cover visible on 1:25 000 scale aerial photographs was taken in the early 1960s and early 1970s. The aerial extent of woody cover measured by the Forestry Commission (1996) used satellite imagery taken in 1992 and that identified by Millington and Towsend (1989) in their survey of woody biomass was based on satellite imagery taken in 1985.

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

2 Table T2 – Forest ownership and management rights

2.1 FRA 2010 Categories and definitions

Category	Definition
Public ownership	Forest owned by the State; or administrative units of the public administration; or by institutions or corporations owned by the public administration.
Private ownership	Forest owned by individuals, families, communities, private co-operatives, corporations and other business entities, private religious and educational institutions, pension or investment funds, NGOs, nature conservation associations and other private institutions.
Individuals *(sub-category of Private ownership)*	Forest owned by individuals and families.
Private business entities and institutions *(sub-category of Private ownership)*	Forest owned by private corporations, co-operatives, companies and other business entities, as well as private non-profit organizations such as NGOs, nature conservation associations, and private religious and educational institutions, etc.
Local communities *(sub-category of Private ownership)*	Forest owned by a group of individuals belonging to the same community residing within or in the vicinity of a forest area. The community members are co-owners that share exclusive rights and duties, and benefits contribute to the community development.
Indigenous / tribal communities *(sub-category of Private ownership)*	Forest owned by communities of indigenous or tribal people.
Other types of ownership	Other kind of ownership arrangements not covered by the categories above. Also includes areas where ownership is unclear or disputed.
Categories related to the holder of management rights of public forest resources	
Public Administration	The Public Administration (or institutions or corporations owned by the Public Administration) retains management rights and responsibilities within the limits specified by the legislation.
Individuals/households	Forest management rights and responsibilities are transferred from the Public Administration to individuals or households through long-term leases or management agreements.
Private institutions	Forest management rights and responsibilities are transferred from the Public Administration to corporations, other business entities, private co-operatives, private non-profit institutions and associations, etc., through long-term leases or management agreements.
Communities	Forest management rights and responsibilities are transferred from the Public Administration to local communities (including indigenous and tribal communities) through long-term leases or management agreements.
Other form of management rights	Forests for which the transfer of management rights does not belong to any of the categories mentioned above.

2.2 National data

2.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Kwesha, D. & Dreiser, D. 1997. Gathering key information about indigenous forests of Zimbabwe.	H	Ownership	1992	
Timber Producers Federation. Zimbabwe Timber Industry Statistics Annual Reports 2003 - 2007	H	Privately owned Commercial Timber Plantation	2005	
C. Musokonyi & F. Matose. 2007. Trends in forest ownership, Institutional Arrangements and the Impacts on Forest Management and Poverty Reduction	H	Management	2007	

2.2.2 Classification and definitions

National class	Definition
Public ownership	All forest owned by the state either directly or indirectly through arms like the Forestry Commission and National Parks. Also includes Towns, Communal Areas and resettled areas which are under the Town Council and Rural District Councils respectively
Private ownership	All Forest and part of the Commercial Timber plantations.
Individuals (sub-category of Private ownership)	Forest owned by individuals and families.
Private business entities and institutions (sub-category of Private ownership)	Forest owned by private corporations, co-operatives, companies and other business entities, as well as private non-profit organizations such as NGOs, nature conservation associations, and private religious and educational institutions, etc.
Categories related to the holder of management rights of public forest resources	
Public Administration	The Public Administration (or institutions or corporations owned by the Public Administration) retains management rights and responsibilities within the limits specified by the legislation.
Individuals/households	Forest management rights and responsibilities are transferred from the Public Administration to individuals or households through long-term leases or management agreements.
Private institutions	Forest management rights and responsibilities are transferred from the Public Administration to corporations, other business entities, private co-operatives, private non-profit institutions and associations, etc., through long-term leases or management agreements.
Communities	Forest management rights and responsibilities are transferred from the Public Administration to local communities (including indigenous and tribal communities) through long-term leases or management agreements.
Other form of management rights	Includes land tenure in transition and this includes resettlement area

2.2.3 Original data

a). Original 1992 data from Source Kwesha, D. & Dreiser, D. 1997

The following table contains data that was gathered during the VegRIS project. Some of the irrelevant data (data for areas outside those that fall within the Forest area after reclassification into FRA 2010 classes) was left out.

National Classes	**Area in hectares**				
	Natural moist forest	**Plantation**	**Woodland**	**Wooded grassland**	**Bushland**
Nat. Parks	6 559	6 559	3 397 633	79 719	1 186 195
Forest land	801	53 006	875 729	534	72 900
State land	0	0	168 186	0	15 887
Communal area	0	1 546	6 531 573	41 703	1 495 142
Resettlement area	396	6 729	2 398 319	121 915	449 264
Total public Forest	**7 756**	**67 840**	**13 371 441**	**243 871**	**3 219 388**
SSCFA[1]	0	112	566 106	23 242	108 573
LSCFA[2]	3 568	86 824	6 954 228	944 357	1 640 137
Town	0	287	27 652	8 758	3 289
Total private forests	**3 568**	**87 223**	**7 547 986**	**976 357**	**1 751 999**
Total	**11 324**	**155 063**	**20 919 427**	**1 220 228**	**4 971 387**

It is important to note that all areas included in the above table may be set aside for other types of land use but, at the time of data compilation, these were still covered by forest as seen on satellite imagery. The national classes shown in the above table will be used to estimate the Public Forest management pattern for 1990.

(b). Forest Tenure Categories for 2007

	State	**Communal**	**Private**
Forest Owner	State: Forestry Commission, Ministry of Lands, Agriculture and Resettlement, Zimbabwe Parks and Wildlife Authority	Community groups in communal and Resettlement Areas	Private individuals, corporate bodies
Area of Forest (ha)	*8 937 487.0*	*2 025 901.7*	*6 566 583.6*
Ownership Arrangement	Constitutional Amendment No. 17, Wildlife Act, Forest Act	Communal Lands Act, Constitutional Amendment No. 17	Private land tittles

Source: Derived from matrix compiled by Musokonyi 2006.(Source 2)

c). Forest Management 2007

	Owner is the exclusive manager		Forest operation contracted/ Partnerships		Devolved management rights		Others	Total
Detailed data public ownership	Strictly limited: No extraction rights for others	User rights/ Customary rights/Permits to hunt, gather dead wood and NWFP	Joint forest management with communities Community timber concessions /licenses	Private company volume permits/logging concession /schemes	Community forest leases/forest management concessions	Private company leases/forest management concessions		
State	66925	1247550	128050	397165				1839690
Local governments:		184073	430892	90000	25319	263		730547

regions, provinces and districts								
Local governments: villages, municipalities	396	4151663			2169695		2025902	8347656
Other public bodies	45891							45891
Total								10963784

N.B the Total area of state forest shown in the above table is the total of State and Communal Land in the **Forest Tenure Categories for 2007**

2.3 Analysis and processing of national data

2.3.1 Estimation and forecasting

Ownership

In 1990 (original data 1992)

Ownership	Area in hectares					Percentage of total forest
	Natural moist forest	Plantation	Woodland	Wooded Grassland[1]		
				of which 50% is forest	Total Forest	
Public	7 756	67 840	13 371 441	121 936	13 568 973	62.5%
Private	3 568	87 223	7 547 986	488 179	8 126 956	37.5%
Total	11 324	155 063	20 919 427	610 115	21 695 929	100.0%

Since there tenure system in the country was still quite stable back in the nineties, for the sake of this report, it was assumed that a change in the Forest area cover was met with a change of the same proportion in the different land ownerships between 1990 and 1992 when the original data was gathered.

In 2005

Percentages derived from data for 2007 Forest Tenure were thus used to estimate the tenure pattern for the year 2005 since there is just a two (2) year difference.

	Public		**Private**
	State	**Communal**	
Area of Forest (ha)	8 801 978	2 002 019	6 454 784
Area of Forest (%)	*51*	*11.6*	*37.4*

In Zimbabwe Communal forest is considered to be owned by the state as the state can move anyone occupying the area should it deem it necessary for the purpose of development. The state exercises this ownership through the Communal Lands Act

No data are available for 2000, therefore the above ratio was used to interpolate figures for that year.

Results are :

	1990	2000	2005
Public ownership (1 000 ha)	13 852	11 828	10 804
Private ownership (1 000 ha)	8 312	7 066	6 455

2.3.2 Reclassification into FRA 2010 categories

Management of Public Forests

In 1990 (original data 1992)

National Classes	Area in hectares (1992)	**%**	**FRA Class**	**Area in hectares (1990)**
Nat. Parks	3450610.5	25.43	Public Administration	**3522564**
Forest land	929803.0	6.85	Private corporations and institutions	**948862**
State land	168186.0	1.24	Public Administration	**171765**
Communal area	6553970.5	48.30	Communities	**6690516**
Resettlement area	2466401.5	18.18	Other	**2518294**
Total public Forest	13568972.5	**100**		**13852000**

The percentages derived from original data (1992), were used to estimate the Public Forest Management pattern for the year 1990.

In 2005 (original data 2007)

	Owner is the exclusive manager		Forest operation contracted/ Partnerships		Devolved management rights		Others	Total
Detailed data public ownership	Strictly limited: No extraction rights for others	User rights/ Customary rights/Permits to hunt, gather dead wood and NWFP	Joint forest management with communities Community timber concessions /licenses	Private company volume permits/logging concession /schemes	Community forest leases/forest management concessions	Private company leases/forest management concessions		
State	**66925**	**1247550**	***128050***	*397165*				1839690
Local governments: regions, provinces and districts		**184073**	***430892***	*90000*	***25319***	*263*		730547
Local governments: villages, municipalities	***396***	**4151663**			***2169695***		2025902	8347656
Other public bodies	**45891**							45891
Total								10963784

Reclassified according to FRA definitions:
Public administration = 5696102 ha => 51.95 %
Communities =2753956 ha => 25.12 %
Private corporations and institutions =487428 ha => 4.45 %

Percentages derived from data for 2007 Forest management was thus used to estimate the management pattern for the year 2005 since there is just a two (2) year difference.

Consequently, the results are in 2005:

Public administration (000 ha)	Communities (000 ha)	Private corporations and institutions (000 ha)	Other (000 ha)	Total (000 ha)
5 613	2 714	481	1 996	10 804

2.4 Data for Table T2

Table 2a - Forest ownership

FRA 2010 Categories	Forest area (1000 hectares)		
	1990	2000	2005
Public ownership	13 852	11 828	10 804
Private ownership	8 312	7 066	6 455
...of which owned by individuals	n/a	n/a	n/a
...of which owned by private business entities and institutions	n/a	n/a	n/a
...of which owned by local communities	n/a	n/a	n/a
...of which owned by indigenous / tribal communities	n/a	n/a	n/a
Other types of ownership	0	0	0
TOTAL	**22 164**	**18 894**	**17 259**

Note: If other types of ownership are reported, please specify details in comment to the table.

Does ownership of trees coincide with ownership of the land on which they are situated?		Yes
	X	No
If **No** above, please describe below how the two differ:		
Ownership of the land lies solely in the hands of the state while any other party can only own the resource on the land.		

Table 2b - Holder of management rights of public forests

FRA 2010 Categories	Forest area (1000 hectares)		
	1990	2000	2005
Public Administration	3 695	n/a	5 613
Individuals	0	n/a	0
Private corporations and institutions	949	n/a	481
Communities	6 690	n/a	2 714
Other	2 518	n/a	1 996
TOTAL	**13 852**	**11 828**	**10 804**

2.5 Comments to Table T2

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Public ownership		
Private ownership		
Other types of ownership		
Management rights	It is not possible to assess the situation in 2000.	

Other general comments to the table
The data on ownership and management is very difficult to come by thus the reliance on research studies done by individuals.

3 Table T3 – Forest designation and management

3.1 FRA 2010 Categories and definitions

Term	Definition
Primary designated function	The primary function or management objective assigned to a management unit either by legal prescription, documented decision of the landowner/manager, or evidence provided by documented studies of forest management practices and customary use.
Protected areas	Areas especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means.
Categories of primary designated functions	
Production	Forest area designated primarily for production of wood, fibre, bio-energy and/or non-wood forest products.
Protection of soil and water	Forest area designated primarily for protection of soil and water.
Conservation of biodiversity	Forest area designated primarily for conservation of biological diversity. Includes but is not limited to areas designated for biodiversity conservation within the protected areas.
Social services	Forest area designated primarily for social services.
Multiple use	Forest area designated primarily for more than one purpose and where none of these alone is considered as the predominant designated function.
Other	Forest areas designated primarily for a function other than production, protection, conservation, social services or multiple use.
No / unknown	No or unknown designation.
Special designation and management categories	
Area of permanent forest estate (PFE)	Forest area that is designated to be retained as forest and may not be converted to other land use.
Forest area within protected areas	Forest area within formally established protected areas independently of the purpose for which the protected areas were established.
Forest area under sustain-able forest management	To be defined and documented by the country.
Forest area with management plan	Forest area that has a long-term (ten years or more) documented management plan, aiming at defined management goals, which is periodically revised.

3.2 National data

3.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
1. Kwesha, D. & Dreiser, D. 1997. Gathering key information about indigenous forests of Zimbabwe.	H	Forests area under different tenure	1992	
2. Shumba, E. M 2001: Biodiversity Planning Support Programme. Integrating Biodiversity	H	Production area and forests goods and	1992	

into forestry sector. Paper prepared for an international workshop "Integration of Biodiversity in National Forestry Planning Programme"CIFOR HQ, Bogor, Indonesia 13-16 August 2001		services		
3. Forest Act	H	Gazetted forest area		
4. Timber Producers Federation. Zimbabwe Timber Industry Statistics Annual Reports 2000 - 2007	H	Area of Commercial Timber Plantation	2000, 2005	

3.2.2 Classification and definitions

Commercial timber production from indigenous forests and woodlands is based mainly on *Pterocarpus angolensis* and *Baiiaea plurijuga*. Forests with theses species are confined to the western part of the country and occupy 5% of the country's total land area. The rest of the country's forests and woodlands have little to no timber of commercial value. The country's indigenous forests and woodlands provide a wide range of products which include fuelwood, small artisan crafts, fodder, fruits, honey, mushrooms, insects, bark for rope, medicines, leaf litter and gum and they are managed for all purpose. Services provided by theses forests include watershed conservation, carbon fixation, and the provision of windbreaks, shade, soil stability and wild life habitat.

National class	**Definition**
Forest area under sustainable forest management	These have significant forest cover and stocking to support the social, economic and environmental dimensions of forestry while ensuring that risks and impacts of unwanted disturbances are minimized, including wildfires, airborne pollution, storm felling, invasive species, pests, diseases and insects. Forest where there are visible efforts to conserve and manage biological diversity at the ecosystem (landscape), species and genetic levels. Such conservation includes the protection of areas with fragile ecosystems, ensuring that diversity of life is maintained, and providing opportunities to develop new products, for example medicines, in the future.

3.2.3 Original data

- Year 1992

	Forest Area[1]	Production area[2]		SSCFA & Towns [3]		Remaining Forests [4]	
	ha	ha	%	ha	%	ha	%
Total	21 695 928	2 143 063	10%	610 158	3%	18 942 707	87%

Notes:
[1]Data from source 1;
[2]Data from source 2;
[3]Small Scale Commercial Farm Area (SSCFA) and trees in towns (Source1);
[4] (1) - (2+3).

- Gazetted Forests area (From Source 3) : 800 258 ha.
- Chirinda Forest (From Source 4) : 606 ha.
(Chirinda Forest is also a gazetted forest but was somehow missed in the list of gazetted Forests of Zimbabwe)
- Total Gazetted Forests = 800 864 ha.

- Commercial Forest Plantations (Data Sourced From Zimbabwe Timber Producers' Federation)

Year	Area
1990	154 437 ha
2000	120 182 ha
2005	108 214 ha

3.3 Analysis and processing of national data

3.3.1 Estimation and forecasting

- Year 1992

		Forests
	FRA Categories	**%**
Production area	Production	10%
SSCFA & Towns	Protection of soil and water (1)	3%
Remaining Forests	Multiple purpose (2)	87%
	Total	**100%**

Notes: - Assumption is that trees in Small Scale Commercial Farm Areas (SSCFA) and Towns are for the protection of soil and water; and

- Assumption that all remaining forests (minus the 800 864 ha of Gazetted Forest Areas) are designated for multipurpose.

Applying the above percentages, then considering that the Gazetted Forest Areas are constant and have a conservation function, the total forest area for 1990, 2000, 2005 and 2010 from T1 provides the following breakdown:

	Area in hectares			
	Forests			
FRA Categories	**1990**	**2000**	**2005**	**2010**
Production	2216390	1889382	1725878	1562374
Protection of soil and water	664917	566815	517763	468712
Conservation of biodiversity	800864	800864	800864	800864
Multiple purpose	18481730	15636760	14214275	12791791
Total	22163901	18893821	17258781	15623741

3.4 Data for Table T3

Table 3a – Primary designated function

FRA 2010 Categories	Forest area (1000 hectares)			
	1990	2000	2005	2010
Production	2 216	1 889	1 726	1 562
Protection of soil and water	665	567	518	469
Conservation of biodiversity	801	801	801	801
Social services	0	0	0	0
Multiple use	18 482	15 637	14 214	12 792
Other (please specify in comments below the table)	0	0	0	0
No / unknown	0	0	0	0
TOTAL	**22 164**	**18 894**	**17 259**	**15 624**

Table 3b – Special designation and management categories

FRA 2010 Categories	Forest area (1000 hectares)			
	1990	2000	2005	2010
Area of permanent forest estate[1]	956	921	909	909
Forest area within protected areas[2]	801	801	801	801
Forest area under sustainable forest management[3]	956	921	909	909
Forest area with management plan[3]	956	921	909	909

[1] Area includes Gazetted Forest Areas according to the Forest Act of Zimbabwe and Commercial Forest Plantation area. These forest areas are protected from conversion to any other land use by law.
[2] Area includes Gazetted Forest Areas according to the Forest Act of Zimbabwe and these areas are being protected for conservation purposes.
[3] Area includes the total area of Forest which fits the description given in the national definition. This Forest area is gazetted in the Forest Act and its management practices are documented in management plans.

3.5 Comments to Table T3

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

Area of permanent forest estate		
Forest area within protected areas		
Forest area under sustainable forest management	This area is gazetted for the purpose of maintaining it as Forest in its current state, (either commercial plantation or indigenous vegetation).	
Forest area with management plan	This Forest area is gazetted and, as a requirement by the Forest Act, is required to be sustainably managed with the management plans being documented so as to provide a guide to all stakeholders.	

Other general comments to the table

4 Table T4 – Forest characteristics

4.1 FRA 2010 Categories and definitions

Term / category	Definition
Naturally regenerated forest	Forest predominantly composed of trees established through natural regeneration.
Introduced species	A species, subspecies or lower taxon, occurring outside its natural range (past or present) and dispersal potential (i.e. outside the range it occupies naturally or could occupy without direct or indirect introduction or care by humans).
Characteristics categories	
Primary forest	Naturally regenerated forest of native species, where there are no clearly visible indications of human activities and the ecological processes are not significantly disturbed.
Other naturally regenerated forest	Naturally regenerated forest where there are clearly visible indications of human activities.
Other naturally regenerated forest of introduced species *(sub-category)*	Other naturally regenerated forest where the trees are predominantly of introduced species.
Planted forest	Forest predominantly composed of trees established through planting and/or deliberate seeding.
Planted forest of introduced species *(sub-category)*	Planted forest, where the planted/seeded trees are predominantly of introduced species.
Special categories	
Rubber plantations	Forest area with rubber tree plantations.
Mangroves	Area of forest and other wooded land with mangrove vegetation.
Bamboo	Area of forest and other wooded land with predominant bamboo vegetation.

4.2 National data

4.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Timber Producers Federation. Zimbabwe Timber Industry Statistics Annual Reports 2000 - 2007	H	Area of Commercial Timber Plantation	1990, 2005	
Forest Act	H	Gazetted forest area		

4.2.2 Classification and definitions

National class	Definition
Primary forest	Naturally regenerated forest of native species, where there are no clearly visible indications of human activities and the ecological processes are not significantly disturbed. In Zimbabwe, these are basically the gazetted Forest areas where none/ very little human activities are ensured by the force of law.
Other naturally regenerated forest	Naturally regenerated forest where there are clearly visible indications of human activities. This includes all other naturally regenerated forest areas (less gazetted forests), in which there is no documented record of the control of human activity.
Planted forest	Forest predominantly composed of trees established through planting and/or deliberate seeding. In Zimbabwe, this is composed of the Commercial timber plantations seeing as there is no documented extensive efforts to artificially regenerate indigenous forest species.

4.2.3 Original data

a) Commercial Forest Plantations (Data Sourced From Zimbabwe Timber Producers' Federation)

Year	Area
1990	154 437 ha
2000	120 182 ha
2005	108 214 ha

For 2010, it is considered that the forest plantation remains at the level of 2005 with 108 214 ha

b) From Forest Act

Gazetted Forests area (From Source 3) : 800 258ha.
Chirinda Forest (From Source 4) : 606ha.

They are constituted the primary forest (800 864 ha), which remains stable from 1990 to 2010.

4.3 Data for Table T4

Table 4a

FRA 2010 Categories	Forest area (1000 hectares)			
	1990	2000	2005	2010
Primary forest	801	801	801	801
Other naturally regenerated forest	21 209	17 973	16 350	14 715
...of which of introduced species	0	0	0	0
Planted forest	154	120	108	108
...of which of introduced species	154	120	108	108
TOTAL	**22 164**	**18 894**	**17 259**	**15 624**

Table 4b

FRA 2010 Categories	Area (1000 hectares)			
	1990	2000	2005	2010
Rubber plantations (Forest)	0	0	0	0
Mangroves (Forest and OWL)	0	0	0	0
Bamboo (Forest and OWL)	0	0	0	0

4.4 Comments to Table T4

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Primary forest	In Zimbabwe, these are basically the gazetted Forest areas where none/ very little human activities are ensured by the force of law as these areas are protected under the Forest Act.	The area reported remains the same throughout the time series because there has not been any field survey to ascertain the level of human activities in Zimbabwean Forests, thus the correspondent used the area that is guaranteed to have been minimally affected by human activities due to its status brought about by the Forest Act.
Other naturally regenerating forest		
Planted forest	All planted forests were established with introduced species.	
Rubber plantations	In Zimbabwe there are no rubber plantations.	
Mangroves	In Zimbabwe there are no mangroves.	
Bamboo	In Zimbabwe there is no significant area of bamboo which can be detected by satellite.	

Other general comments to the table

5 Table T5 – Forest establishment and reforestation

5.1 FRA 2010 Categories and definitions

Term	Definition
Afforestation	Establishment of forest through planting and/or deliberate seeding on land that, until then, was not classified as forest.
Reforestation	Re-establishment of forest through planting and/or deliberate seeding on land classified as forest.
Natural expansion of forest	Expansion of forests through natural succession on land that, until then, was under another land use (e.g. forest succession on land previously used for agriculture).

5.2 National data

5.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Timber Producers Federation. Zimbabwe Timber Industry Statistics Annual Reports 2000 - 2007	H	Area of Commercial Timber Plantation	1990, 2005	

5.2.2 Original data

- Total Commercial Plantation Plantings for period 1988 to 1992 (5 years)
= 15 494.5 ha, which means 3 099 ha/y;
- Total Commercial Plantation Plantings for period 1998 to 2002 (only data from 2000 to 2002, 3 years)
= 16 926 ha, which means 5 642 ha/y;
- Total Commercial Plantation Plantings for period 2003 to 2007 (5 years)
= 30 629 ha, which means 6 126 ha/y.

5.3 Analysis and processing of national data

5.3.1 Estimation and forecasting

The only plantation data that is documented is for the commercial forest plantations sets were the land was already classified as forest and so, it was included under reforestation. These data sets were divided by the number of years in the time series involved to come up with a figure to be used in table T5.

5.4 Data for Table T5

FRA 2010 Categories	Annual forest establishment (hectares/year)			...of which of introduced species [1)] (hectares/year)		
	1990	2000	2005	1990	2000	2005
Afforestation	0	0	0	0	0	0
Reforestation	3 099	5 642	6 126	3 099	5 642	6 126
...of which on areas previously planted	3 099	5 642	6 126	3 099	5 642	6 126
Natural expansion of forest	0	0	0	0	0	0

5.5 Comments to Table T5

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

Other general comments to the table

6 Table T6 – Growing stock

6.1 FRA 2010 Categories and definitions

Category	Definition
Growing stock	Volume over bark of all living trees more than X cm in diameter at breast height (or above buttress if these are higher). Includes the stem from ground level or stump height up to a top diameter of Y cm, and may also include branches to a minimum diameter of W cm.
Growing stock of commercial species	Growing stock (see def. above) of commercial species.

6.2 National data

6.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
1. http://www.savannas.net/savt3.htm	M	Above ground biomass ton/ha for woodlands and Savannah	1996	
2. Fuller, Ngamo , Sikumi, Umgusa, Bembsi, Gwaai, Inseze, Nyamandhlovu, Lupaka, Mpindo, Pumula, Inkosikazi, Mwenezi, Lake Alice. 2000 Forest inventories. Forest Commission, Zimbabwe	L	Vol/ha of indigenous tree species	2000	
3. Millington, A., and Towsend, J. (eds.) 1989. Biomass assessment. Woody biomass in the SADC region. Earthscan Publication Ltd. London. UK	M	Derivation of Growing Stock	1985	

6.2.2 Classification and definitions

National class	Definition
Growing stock (total volume)	The total volume comprises the whole tree volume excluding stumps and roots to a tip diameter of 7.5 cm
Commercial growing stock	Volume of species used for industrial purposes (exotic and natural species)

6.2.3 Original data

The only available data on growing stock are for plantations. For the natural forests and woodlands, growing stock is calculated from biomass data from the following source: http://www.savannas.net/savt3.htm

Furthermore, there are data on commercial growing stock on the production areas of natural forests.

a. National data on Commercial plantations areas and growing stock per hectare.

	Area in ha				
National categories of plantations	**1990[1]**	**2000[2]**	**2005[2]**	**2010[3]**	**Vol/ha (m3/ha)[4]**
Pine	*105 927*	*79 082*	*72 311*	*72 311*	93
Other hardwoods	*48 510*	*41 100*	*35 903*	*35 903*	100
Total Plantations	**154 437**	**120 182**	**108 214**	**108 214**	

Notes:
[1] *Source Kwesha, D. & Dreiser, D. 1997 (T3)*
[2] *Source Timber Producers Federation Plantation Statistics*
[3] *Forecasted area of commercial timber plantations for 2010, due to the fact that the Government has declared that these areas will be kept as timber plantations and not be converted to other uses.*
[4] *From Source 2.*

b. National data on Biomass in forest and Other Wooded Land

Category	**Biomass (t/ha)[1]**
Forest	
Dense Savannah Woodland	71.22
Open Savannah and *Baikiaea* Woodland	71.22
Seasonal Savannah Woodland	19.85
Dry Savannah Woodland	9.44

Note:
[1] *Source 3 :* ***Millington, A., and Towsend, J. (eds.)*** *1989. Biomass assessment. Woody biomass in the SADC region. Earthscan Publication Ltd. London. UK*

c. Growing stock composition, ***Year 2000 Forest Commission Inventories***
Some inventories were conducted in the demarcated forests of Zimbabwe and these were used to come up with average growing stock per hectare per species (i.e. for species which are either of commercial value or which dominate the forested areas). Below is a table containing the results. As demarcated forests (total of 800 864 ha) are distributed all over Zimbabwe and are mainly of the land cover type which falls within the FRA2010 'Forest' category, the average species-growing stock per hectare were considered to be a good enough representative. They were also the only data available on growing stock within indigenous woodlands for Zimbabwe.

Species	**Growing stock (m^3/ha)[1]**
Brachystegia spiciformis (Msasa)	10.4
Julbernadia globiflora (Munondo)	0.71
Colophospermum mopane (Mopane)	0.26
Baikiaea plurijuga (Zambezi teak)	4.1
Terminalia sericea (Silver terminalia)	0.07
Dichrostachys cinerea (Sickle bush)	0.01
Burkea africana (Red syringa)	0.01
Combretum molle (Velvet bushwillow)	0.15
Pinus patula	92.5
Eucalyptus grandis	100.00

[1] *Source 2 : Year 2000 Forest inventories. Forestry Commission, Zimbabwe*
Note: *Assumption is that vol/ha is the same in 1990 as in 2000, 2005 and 2010*

6.3 Analysis and processing of national data

6.3.1 Estimation and forecasting

a. Calculating Growing Stock for plantations

Growing stock was obtained by multiplying vol/ha as per category of plantation, with Plantation area, all from the above table.

National categories of plantations	Growing stock of plantations and production areas in m3			
	1990	**2000**	**2005**	**2010**
Pine	*9 851 211*	*7 354 626*	*6 724 923*	*6 724 923*
Other hardwoods	*4 851 000*	*4 110 000*	*3 590 300*	*3 590 300*
Total Growing Stock	**14 702 211**	**11 464 626**	**10 315 223**	**10 315 223**

b. Calculating Growing Stock in forest

Category	Biomass (tons/ha)[1]	Area in ha	Total Biomass (tons)
Forest			
Dense Savannah Woodland	71.22	1 871 925	133 318 499
Open Savannah and *Baikiaea* Woodland	71.22	11 662 033	830 569 990
Seasonal Savannah Woodland	19.85	311 278	6 178 868
Dry Savannah Woodland	9.44	3 165 292	29 880 356
Mopane Woodland and Escarpment Thicket	36.97	6 788 414	250 967 666
Total Forest		**23 798 942**	**1 250 915 379**

Note : Biomass stock per hectare derived from a Database for biomass estimation documented in **source 3.**

The different Biomasses for the 1985 land cover were added together, and then the averages were calculated so as to come up with:

- Forest (tons/ha): 52.56

Growing stock has then been estimated from the aboveground biomass figures by using the following formula and applying default conversion factors.

GS = AGB / BEF / WD
GS = Growing stock
AGB = Above-ground biomass
for the forests:
BEF = Biomass expansion factor = 2.4
WD = Wood density = 0.58

Growing Stock
for forest = 37.76 m3/ha

To come up with the Growing stock for the Indigenous Forest, the respective Growing Stock per hectare for each category was multiplied by the corresponding area. For the Total Forest Growing stock, the correspondent added the growing stock in Commercial plantations plus Growing Stock in the indigenous Forests.

FRA Categories	**1990**	**2000**	**2005**	**2010**
Natural (Indig.) Forests Area (ha)[1]	22 009 464	18 773 639	17 150 567	15 515 527
Natural (Indig.) Forest GS (m3)[1]	831 077 361	708 892 609	647 605 410	585 866 300
Plantation Area (ha)	154 437	120 182	108 214	108 214
Plantation GS (m3)	14 702 211	11 464 626	10 315 223	10 315 223
Forests GS (m3)	**845 779 572**	**720 357 235**	**657 920 633**	**587 181 523**

Growing Stock Composition (Source Forest inventories, 2000):
In Zimbabwe the only species specific data available are average growing stocks per hectare which were derived from Gazetted Forest areas. The Gazetted forest areas, being distributed across the country and including mostly area which falls under Forest, it was decided to multiply the average growing stock per hectare of the individual indigenous species from original data (c) by the total area of indigenous forest (i.e. Total Forest area less area of Commercial Timber Plantations). The average growing stock per hectare of the various commercial forest species were also multiplied by their respective areas to come up with the data in the table below.

Assumption: The correspondent assumes that all the indigenous species are found throughout the forest area, thus the use of the area of indigenous forest area as a multiplier for all indigenous species.

	Growing stock (m3)		
Species	**1990**	**2000**	**2005**
Brachystegia spiciformis (Msasa)	228 898 426	195 245 846	178 365 897
Baikiaea plurijuga (Zambezi teak)	90 238 802	76 971 920	70 317 325
Julbernadia globiflora (Munondo)	15 626 719	13 329 284	12 176 903
Pinus patula	9 798 248	7 315 085	6 688 768
Colophospermum mopane (Mopane)	5 722 461	4 881 146	4 459 147
Eucalyptus grandis	4 851 000	4 110 000	3 590 300
Combretum molle (Velvet bushwillow)	3 301 420	2 816 046	2 572 585
Terminalia sericea (Silver terminalia)	1 540 663	1 314 155	1 200 540
Dichrostachys cinerea (Sickle bush)	220 095	187 736	171 506
Burkea africana (Red syringa)	220 095	187 736	171 506
Sub-Total	360 417 929	306 358 954	279 714 477
Remainder	485 361 643	413 998 281	378 206 156
Total growing stock	**845 779 572**	**720 357 235**	**657 920 633**

6.4 Data for Table T6

Table 6a – Growing stock

FRA 2010 category	Volume (million cubic meters over bark)							
	Forest				Other wooded land			
	1990	2000	2005	2010	1990	2000	2005	2010
Total growing stock	846	721	658	596	n/a	n/a	n/a	n/a
... of which coniferous	9.85	7.35	6.72	6.72	n/a	n/a	n/a	n/a
... of which broadleaved	836.15	713.65	651.28	589.28	n/a	n/a	n/a	n/a
Growing stock of commercial species	14.70	11.47	10.32	10.32	n/a	n/a	n/a	n/a

Table 6b – Growing stock of the 10 most common species

FRA 2010 category / Species name			Growing stock in forest (million cubic meters)		
Rank	Scientific name	Common name	1990	2000	2005
1st	*Brachystegia spiciformis*	Msasa	228.90	195.25	178.37
2nd	*Baikiaea plurijuga*	Zambezi teak	90.24	76.97	70.32
3rd	*Julbernadia globiflora*	Munondo	15.63	13.33	12.18
4th	*Pinus patula*	-	9.80	7.32	6.69
5th	*Colophospermum mopane*	Mopane	5.72	4.88	4.46
6th	*Eucalyptus grandis*	-	4.85	4.11	3.59
7th	*Combretum molle*	Velvet bushwillow	3.30	2.82	2.57
8th	*Terminalia sericea*	Silver terminalia	1.54	1.31	1.20
9th	*Dichrostachys cinerea*	Sickle bush	0.22	1.88	0.17
10th	*Burkea africana*	Red syringe	0.22	1.88	0.17
Remaining			485.36	410.61	378.20
TOTAL			**845.78**	**720.36**	**657.92**

Note: Rank refers to the order of importance in terms of growing stock, i.e. 1st is the species with the highest growing stock. Year 2000 is the reference year for defining the species list and the order of the species.

Table 6c – Specification of threshold values

Item	Value	Complementary information
Minimum diameter (cm) at breast height[1] of trees included in growing stock (X)	5	
Minimum diameter (cm) at the top end of stem for calculation of growing stock (Y)	7.5	
Minimum diameter (cm) of branches included in growing stock (W)	n/a	
Volume refers to "above ground" (AG) or "above stump" (AS)	AG	AS for plantations.

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

6.5 Comments to Table T6

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Total growing stock		
Growing stock of broadleaved / coniferous	In Zimbabwe, there are no coniferous species which are indigenous to the country. Thus the report uses the growing stock for pine species which are within the commercial timber plantations and constitute the largest and only known area coverage of conifers. The growing stock of broadleaved is simply the total growing stock for area classified as 'Forest' less that of conifers.	
Growing stock of commercial species	This includes all growing stock within commercial timber plantations.	
Growing stock composition	The growing stock is an estimate from inventories that have been conducted in demarcated indigenous forests plantations and natural forests and woodlands in communal areas resettlement areas and commercial farms.	

Other general comments to the table

7 Table T7 – Biomass stock

7.1 FRA 2010 Categories and definitions

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

7.2 National data

7.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
http://www.savannas.net/savt3.htm	M	Root-shoot ratio for woodlands and Savannah	1996	
http://www.ipcc-nggip.iges.or.jp/public/2006gl/index.htm	M	Biomass conversion and expansion factor	2001	
Timber Producers Federation. Zimbabwe Timber Industry Statistics Annual Reports 2003 - 2007	H	Areas of Conifers	2003, 2004, 2005	
Millington, A., and Towsend, J. (eds.) 1989. Biomass assessment. Woody biomass in the SADC region. Earthscan Publication Ltd. London. UK	M	Derivation of Growing Stock	1985	

7.2.2 Classification and definitions

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

7.2.3 Original data

From tables T1 and T6

	1990	2000	2005	2010
Natural (Indig.) Forests Area (ha)[1]	22 009 464	18 773 639	17 150 567	15 515 527

with the forest biomass of 52.56 tonnes/ha.

From Table T6.

Growing Stock	**1990**	**2000**	**2005**	**2010**
Plantation GS (m3)	14 702 211	11 464 626	10 315 223	10 315 223
....of which of Pine/Coniferous	*9 851 211*	*7 354 626*	*6 724 923*	*6 724 923*
of which of Other hardwoods	*4 851 000*	*4 110 000*	*3 590 300*	*3 590 300*

7.3 Analysis and processing of national data

7.3.1 Estimation and forecasting

a) Calculation of Above Ground Biomass Stock
- for plantation with the formula:

AGB = GS * BCEF

Where: AGB = Above-ground Biomass (tonnes)
GS = Growing Stock
BCEF = Biomass conversion and expansion factor (Above ground biomass / Growing Stock

Knowing that :
- for the plantations
of which coniferous : BCEF = 0.7
of which broadleaved : BCEF = 0.9
based on Guidelines for Country Reporting to FRA 2010, since Zimbabwe is located in the Tropical Region.

- for natural (indig.) forest
knowing that the forest biomass is 52.56 tonnes/ha.

Above Ground Biomass Stock	**1990**	**2000**	**2005**	**2010**
Natural (Indig.) Forest GS (tonnes)	1156817428	986742466	901433802	815496099
Plantation GS (tonnes)	11261748	8847238	7938716	7938716
....of which of Pine/Coniferous	*6895848*	*5148238*	*4707446*	*4707446*
of which of Other hardwoods	*4365900*	*3699000*	*3231270*	*3231270*
Forests GS (tonnes)	**1168079176**	**995589704**	**909372518**	**823434815**

b) Calculation of Below Ground Biomass Stock
Applying the formula: BGB = AGB*R (0.27)

Below Ground Biomass Stock	1990	2000	2005	2010
Forests GS (tonnes)	315381378	268809220	245530580	222327400

7.4 Data for Table T7

FRA 2010 category	Biomass (million metric tonnes oven-dry weight)							
	Forest				Other wooded land			
	1990	2000	2005	2010	1990	2000	2005	2010
Above-ground biomass	1 168	996	909	823	n/a	n/a	n/a	n/a
Below-ground biomass	315	269	246	222	n/a	n/a	n/a	n/a
Dead wood	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
TOTAL	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

7.5 Comments to Table T7

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Above-ground biomass		
Below-ground biomass		
Dead wood		

Other general comments to the table

8 Table T8 – Carbon stock

8.1 FRA 2010 Categories and definitions

Category	Definition
Carbon in above-ground biomass	Carbon in all living biomass above the soil, including stem, stump, branches, bark, seeds, and foliage.
Carbon in below-ground biomass	Carbon in all biomass of live roots. Fine roots of less than 2 mm diameter are excluded, because these often cannot be distinguished empirically from soil organic matter or litter.
Carbon in dead wood	Carbon in all non-living woody biomass not contained in the litter, either standing, lying on the ground, or in the soil. Dead wood includes wood lying on the surface, dead roots, and stumps larger than or equal to 10 cm in diameter or any other diameter used by the country.
Carbon in litter	Carbon in all non-living biomass with a diameter less than the minimum diameter for dead wood (e.g. 10 cm), lying dead in various states of decomposition above the mineral or organic soil.
Soil carbon	Organic carbon in mineral and organic soils (including peat) to a specified depth chosen by the country and applied consistently through the time series.

8.2 National data

8.2.1 Original data

From tableT7

FRA Categories	1990	2000	2005	2010
Natural (Indig.) Forests Area (ha)	22 009 464	18 773 639	17 150 567	15 515 527
Plantation Area (ha)	154 437	120 182	108 214	108 214
of which with Pine (ha)	*105 927*	*79 082*	*72 311*	*72 311*
of which with hardwoods (ha)	*48 510*	*41 100*	*35 903*	*35 903*

8.3 Analysis and processing of national data

8.3.1 Estimation and forecasting

A/- Carbon stock is calculated by multiplying the biomass by 0.47. Carbon stocks of litter and soil have not been estimated.

B/- Carbon in the litter has been estimated, based on the standard factors of 2.1 C $ha^{-1}$for broadleaf deciduous and 5.2 C ha^{-1} for conifers. (Based on the Appendix 5, table 5.9, FRA 2010 Guidelines), and

FRA Categories	1990	2000	2005	2010
Natural (Indig.) Forests Area (C)	46 219 874	39 424 642	36 016 191	32 582 607
Plantation Area (C)	652691	497536	451414	451414
of which with Pine (C)	*550 820*	*411 226*	*376 017*	*376 017*
of which with hardwoods (C)	*101 871*	*86 310*	*75 396*	*75 396*
Total (C)	47 525 257	40 419 715	36 919 018	33 485 434

- Soil carbon has been estimated, based on the factor of 35 (this is an average of HAC, LAC and Sandy soils since Zimbabwe generally has a mixture of soil types, based on the Appendix 5, table 5.10 (Guidelines for Country Reporting to FRA 2010).

The biomass/ hectare values are then applied to the forest areas values in table T1 to get the biomass for the reporting years.

8.4 Data for Table T8

FRA 2010 Category	Carbon (Million metric tonnes)							
	Forest				Other wooded land			
	1990	2000	2005	2010	1990	2000	2005	2010
Carbon in above-ground biomass	549.00	467.93	427.41	387.01	n/a	n/a	n/a	n/a
Carbon in below-ground biomass	148.23	126.34	115.40	104.49	n/a	n/a	n/a	n/a
Sub-total: Living biomass	697.23	594.27	542.80	491.51	n/a	n/a	n/a	n/a
Carbon in dead wood	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Carbon in litter	47.53	40.42	36.92	33.49	n/a	n/a	n/a	n/a
Sub-total: Dead wood and litter	***n/a***	***n/a***	***n/a***	***n/a***	***n/a***	***n/a***	***n/a***	***n/a***
Soil carbon	776	661	604	547	n/a	n/a	n/a	n/a
TOTAL	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**

Soil depth (cm) used for soil carbon estimates	30

8.5 Comments to Table T8

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Carbon in above-ground biomass		
Carbon in below-ground biomass		
Carbon in dead wood		
Carbon in litter		
Soil carbon		

Other general comments to the table

9 Table T9 – Forest fires

9.1 FRA 2010 Categories and definitions

Category	Definition
Number of fires	Average number of vegetation fires per year in the country.
Area affected by fire	Average area affected by vegetation fires per year in the country.
Vegetation fire *(supplementary term)*	Any vegetation fire regardless of ignition source, damage or benefit.
Wildfire	Any unplanned and uncontrolled vegetation fire that, regardless of ignition source, may require suppression response, or other action according to agency policy.
Planned fire	A management-ignited vegetation fire that burns within prescription, i.e. the fire is confined to a predetermined area and produces the fire behaviour and fire characteristics required to attain planned fire treatment and/or resource management objectives.

9.2 National data

9.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Forestry Commission 1984 – 2003. Monthly and annual fire reports.	H	Fire reports in demarcated indigenous forests	1987-1992	Each forest reserve reports on fire incidences during the fire season
Timber Producers Federation	H	Forest Fires that have occurred on Commercial Timber Plantations	1988 - 2007	Personal communication with TPF offices

9.2.2 Original data

A summary of the commercial forest area (ha) burnt between 1988-1992, 1998-2002 and 2003-2007 fires seasons

Year									
1988	1989	1990	1991	1992	1998	1999	2000	2001	2002
249	279	349	141	2214	167	147	144	14	1494

Year				
2003	2004	2005	2006	2007
3142	1861	11221	1782	1924

A summary of the indigenous forest area (ha) burnt between 1988-1992, 1998-2002 and 2003-2007 fires seasons

	Years		
	from 1988 to 1992	from 1998 to 2002	from 200 to 2007
Total burnt Area (Ha)	64 564	18 348	78 361

N.B: this includes only those fires that affected forested areas

9.3 Analysis and processing of national data

9.3.1 Estimation and forecasting

a) 5-Year Averages for Commercial Forest Areas

	Ref. Period		
	1988-1992	1998- 2002	2003- 2007
Average burnt Area (Ha)	646.4	393.2	3 984.2

b) 5-Year Averages for Indigenous Forest Areas

	Ref. Period		
	1988-1992	1998- 2002	2003- 2007
Average burnt Area (Ha)	12 912.8	3 669.6	15 672.2

9.4 Data for Table T9

Table 9a

FRA 2010 category	**Annual average for 5-year period**					
	1990		**2000**		**2005**	
	1000 hectares	**number of fires**	**1000 hectares**	**number of fires**	**1000 hectares**	**number of fires**
Total land area affected by fire	13.6	n/a.	4.1	n/a.	19.7	n/a.
... of which on forest	13.6	n/a.	4.1	n/a.	19.7	n/a.
... of which on other wooded land	0	n/a.	0	n/a.	0	n/a.
... of which on other land	0	n/a.	0	n/a.	0	n/a.

Table 9b

FRA 2010 category	Proportion of forest area affected by fire (%)		
	1990	2000	2005
Wildfire	n/a	n/a	n/a
Planned fire	n/a	n/a	n/a

9.5 Comments to Table T9

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Area affected by fire	Only data for demarcated indigenous forests and commercial timber plantations is available in terms of disturbances by fire. Fire data for areas outside these is not normally captured. The fires have not been formally monitored. There is a definite project proposal to do so with effect from 2009 in collaboration with the FAO using the MODIS-STAR PRODUCT. We are currently preparing to commence this project.	No real trend can be established as there were large gaps in the data available, but the available data shows a small proportion of the forest is affected. It is important to note that most of these wild fires generally occur in commercial timber plantations.
Number of fires		
Wildfire / planned fire	The data used in the compilation of T9 only includes that of wild fires as these are the ones that are monitored and documented. However it is important to note that in Zimbabwe we do have planned fires (i.e Fireguard burning and occasional block burning).	

Other general comments to the table

10 Table T10 – Other disturbances affecting forest health and vitality

10.1 FRA 2010 Categories and definitions

Term	Definition
Disturbance	Damage caused by any factor (biotic or abiotic) that adversely affects the vigour and productivity of the forest and which is not a direct result of human activities.
Invasive species	Species that are non-native to a particular ecosystem and whose introduction and spread cause, or are likely to cause, socio-cultural, economic or environmental harm or harm to human health.
Category	**Definition**
Disturbance by insects	Disturbance caused by insect pests.
Disturbance by diseases	Disturbance caused by diseases attributable to pathogens, such as bacteria, fungi, phytoplasma or virus.
Disturbance by other biotic agents	Disturbance caused by biotic agents other than insects or diseases, such as wildlife browsing, grazing, physical damage by animals, etc.
Disturbance caused by abiotic factors	Disturbances caused by abiotic factors, such as air pollution, snow, storm, drought, etc.

10.2 National data

10.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Forestry Commission Pathology Laboratory	L	Pests and Diseases reports	1988 - 2007	Data too general for use as it does not give affected areas, but merely pest and disease settings (i.e. name, tree species affected, years of outbreak and location of outbreak.

10.3 Data for Table T10

Table 10a – Disturbances

FRA 2010 category	Affected forest area (1000 hectares)		
	1990	2000	2005
Disturbance by insects	n/a	n/a	n/a
Disturbance by diseases	n/a	n/a	n/a
Disturbance by other biotic agents	n/a	n/a	n/a
Disturbance caused by abiotic factors	n/a	n/a	n/a
Total area affected by disturbances	n/a	n/a	n/a

Table 10b – Major outbreaks of insects and diseases affecting forest health and vitality

Description / name	Tree species or genera affected (scientific name)	Year(s) of latest outbreak	Area affected (1000 hectares)	If cyclic, approx. cycle (years)
Scale Insect	*Aspidoprocus glaber*	1998	215	n/a
Short-hole Borers	Bostrychids species	2005	n/a	n/a

Note: Area affected refers to the total area affected during the outbreak.

Table 10c – Area of forest affected by woody invasive species

Scientific name of woody invasive species	Forest area affected 2005 (1000 hectares)
No data available	n/a
Total forest area affected by woody invasive species	n/a

10.4 Comments to Table T10

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Disturbance by insects		
Disturbance by diseases		
Disturbance by other biotic agents		
Disturbance caused by abiotic factors		
Major outbreaks		
Invasive species		

Other general comments to the table
The only data that has been captured on biotic and abiotic factors that adversely affect forest health and vitality does not include the area (in hectares) affected.

11 Table T11 – Wood removals and value of removals

11.1 FRA 2010 Categories and definitions

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

11.2 National data

11.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
1.FAO Statistics Division, 2008	M	Wood removal Fuelwood	Figures for 1988 to 2006	
2. Timber Producers Federation 2007	H	Value of wood removed from plantations	2007	Annual Timber Industry statistics. Value of wood removed for sawn timber, veneer and plywood, treated and untreated poles, particle and fibreboard, paper & paper products, wattle extract and matches.
3. Forestry Commission	H	Value of wood removed from natural forests	2007	Value per cubic metre of fuel wood

11.2.2 Classification and definitions

National class	Definition
Industrial roundwood removals	The wood removed (volume of roundwood over bark) for production of goods and services other than energy production (woodfuel).
Woodfuel removals	The wood removed for energy production purposes, regardless whether for industrial, commercial or domestic use.

11.2.3 Original data

Production of Industrial Roundwood (1000 m3 under bark)															
Country	Year														
	1988	1989	1990	1991	1992	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Zimbabwe	644.0	644.0	644.0	705.0	715.0	1114.8	1137.4	978.4	992.4	992.4	992.4	992.4	827.0	770.9	770.9

Production of woodfuel (1000 m3 under bark)										
Country	Year									
	1988	1989	1990	1991	1992	1998	1999	2000	2001	2002
Zimbabwe	6260.2	6260.2	6260.2	6260.2	6260.2	7879.2	8115.2	8115.2	8115.2	8115.2

Production of woodfuel (1000 m3 under bark)					
Country	Year				
	2003	2004	2005	2006	2007
Zimbabwe	8115.2	8115.2	8115.2	8380.4	8461.4

11.3 Analysis and processing of national data

11.3.1 Estimation and forecasting

Conversion factor used to change volume under-bark to volume over-bark = 1.15 (Global default conversion factor)

Production (1000 m3)						
Product	Year					
	1990		2000		2005	
	Vol. u.b.	Vol. o.b.	Vol. u.b.	Vol. o.b.	Vol. u.b.	Vol. o.b.
Industrial Roundwood[1]	670.4	771.0	1047.7	1 204.9	870.7	1001.3
Woodfuel[1]	6260.2	7 199.2	8068.0	9 278.2	8237.5	9473.1

Notes: [1] Values are five year averages

11.4 Data for Table T11

FRA 2010 Category	**Industrial roundwood removals**			**Woodfuel removals**		
	1990	**2000**	**2005**	**1990**	**2000**	**2005**
Total volume (1000 m^3 o.b.)	771.0	1 204.9	1 001.3	7 199.2	9 278.2	9 473.1
... of which from forest	771.0	1 204.9	1 001.3	7 199.2	9 278.2	9 473.1
Unit value (local currency / m^3 o.b.)	n/a	n/a	n/a	n/a	n/a	n/a
Total value (1000 local currency)	n/a	n/a	n/a	n/a	n/a	n/a

Note: The figures for the reporting years refer to the averages of annually affected areas for the 5-year periods 1988-1992, 1998-2002 and 2003-2007 respectively.

	1990	**2000**	**2005**
Name of local currency	Zimbabwean dollar (ZWD)	Zi**mbabwean** dollar (ZWD)	**Zimbabwean** dollar (ZWD)

11.5 Comments to Table T11

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Total volume of industrial roundwood removals		
Total volume of woodfuel removals		
Unit value	Due to the hyper-inflationary conditions in Zimbabwe, there would be no basis for comparison if the average prices for the respective periods were used.	
Total value		

Other general comments to the table

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

Data is not available for this table.
All trade in non-wood forest products in Zimbabwe has been on an informal basis.

13 Table T13 – Employment

13.1 FRA 2010 Categories and definitions

Category	Definition
Full-time equivalents (FTE)	A measurement equal to one person working full-time during a specified reference period.
Employment	Includes all persons in paid employment or self-employment.
Paid employment	Persons who during a specified reference period performed some work for wage or salary in cash or in kind.
Self-employment	Persons who during a specified reference period performed some work for profit or family gain in cash or in kind (e.g. employers, own-account workers, members of producers' cooperatives, contributing family workers).

13.2 National data

13.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Timber Producers Federation. Timber Industry Statistics	H	Commercial Timber Industry Labour Statistics	1985-1990 1991-2000	
Forestry Commission. Monthly Progress Reports.	L	Labour Statistics	2000	Only data for 2000 was available
National Parks and Wildlife Management Authority	H	Labour Statistics	1990, 2000, 2005	Personal communication with Human Resources manager.

13.2.2 Original data

- Paid employment :

National	Employment (1000 person-years)		
	1990	2000	2005
Primary production of goods[1]	14.400	14.445	13.173
Employment in management of protected areas[2]	1.900	2.769	2.500

Notes:
[1] Source: Timber Producers' Federation of Zimbabwe
[2] Data from Source 3 plus data from Source 2 where data from source 2 was available (i.e. for year 2000).

13.3 Data for Table T13

FRA 2010 Category	Employment (1000 years FTE)		
	1990	2000	2005
Employment in primary production of goods	14.4	14.5	13.2
...of which paid employment	14.4	14.5	13.2
...of which self-employment	n/a	n/a	n/a
Employment in management of protected areas	1.9	2.8	2.5

13.4 Comments to Table T13

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Employment in primary production of goods	Information is limited to paid-employment.	
Paid employment / self-employment		
Employment in management of protected areas		

Other general comments to the table

14 Table T14 – Policy and legal framework

14.1 FRA 2010 Categories and definitions

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

14.2 Data for Table T14

Indicate the existence of the following (2008)			
1. Forest policy statement with national scope			Yes
		X	No
If Yes above, provide:	Year of endorsement		
	Reference to document		
2. National forest programme (nfp)		X	Yes
			No
If Yes above, provide:	Name of nfp in country	n/a	
	Starting year	n/a	
	Current status	X	In formulation
			In implementation
			Under revision
			Process temporarily suspended
	Reference to document or web site	n/a	
3. Law (Act or Code) on forest with national scope		X	Yes, specific forest law exists
			Yes, but rules on forests are incorporated in other (broader) legislation
			No, forest issues are not regulated by national legislation
If Yes above, provide:	Year of enactment	1949	
	Year of latest amendment	1996	
	Reference to document	Forest Act Chapter 19:05	

In case the responsibility for forest policy- and/or forest law-making is decentralized, please indicate the existence of the following and explain in the comments below the table how the responsibility for forest policy- and law-making is organized in your country.		
4. Sub-national forest policy statements		Yes
	X	No
If Yes above, indicate the number of regions/states/provinces with forest policy statements		
5. Sub-national Laws (Acts or Codes) on forest		Yes
	X	No
If Yes above, indicate the number of regions/states/provinces with Laws on forests		

Explanatory notes to the reporting table:

1. The national forest policy document or statement describes the objectives, priorities and means for implementation of the forest policy. It is endorsed when it is officially recognised as a government policy or instruction. The endorsement is formalised by the Minister in charge of forests by a dated and signed document.
2. The term "national forest programme" is a generic expression referring to a wide range of approaches towards forest policy formulation, planning and implementation at national and sub-national levels and providing a framework and guidance for country-driven forest sector development in consultation and participation of all stakeholders and in consistence with policies of other sectors and international policies.
3. The term "law on forest" refers to a Law (Act or Code) providing specific rules on forests and forest sector management, such as access, management and use of forest resources. The Law is enacted when the legislative authority adopted its text.
4. Same as (1) but the policy documents or statements refer to sub-national administrative units, e.g. States in a Federation or Autonomous Regions or Provinces.
5. Same as (3) but indicate if specific Laws on forests exist at sub-national level (at the level of regions/states/provinces).

14.3 Comments to Table T14

Variable / category	Comments related to data, definitions, etc.
Forest policy statement with national scope	
National forest programme (nfp)	
Law (Act or Code) on forest with national scope	
Sub-national forest policy statements	
Sub-national Laws (Acts or Codes) on forest	

Other general comments to the table

15 Table T15 – Institutional framework

15.1 FRA 2010 Categories and definitions

Term	Definition
Minister responsible for forest policy-making	Minister holding the main responsibility for forest issues and the formulation of the forest policy.
Head of Forestry	The Head of Forestry is the Government Officer responsible for implementing the mandate of the public administration related to forests.
Level of subordination	Number of administrative levels between the Head of Forestry and the Minister.
University degree	Qualification provided by University after a minimum of 3 years of post secondary education.

15.2 Data for Table T15

Table 15a

FRA 2010 Category	2008	
Minister responsible for forest policy formulation : please provide full title	Honourable Minister of Environment and Tourism	
Level of subordination of Head of Forestry within the Ministry		1st level subordination to Minister
		2nd level subordination to Minister
	X	3rd level subordination to Minister
		4th or lower level subordination to Minister
Other public forest agencies at national level	No	
Institution(s) responsible for forest law enforcement	Forestry Commission	

Table 15b

FRA 2010 Category	Human resources within public forest institutions					
	2000		2005		2008	
	Number	%Female	Number	%Female	Number	%Female
Total staff	369	n/a	557	n/a	550	n/a
...of which with university degree or equivalent	n/a	n/a	n/a	n/a	24	29.2

Note: Excludes people employed in State-owned enterprises, education and research, as well as temporary / seasonal workers.
Source: Forestry Commission.

15.3 Comments to Table T15

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Minister responsible for forest policy formulation		
Level of subordination of Head of Forestry within the Ministry	The General Manager reports to the Board of Directors which reports to the Permanent Secretary. The Permanent Secretary in turn reports to the Minister.	
Other public forest agencies at national level	The Forestry Commission is basically the only institution which is involved directly in forestry and whose human resource base is 100% dedicated to forestry activities. Other institutions like Environmental Management Agency and National Parks were not included since they are not solely engaged in forest regulation.	
Institution(s) responsible for forest law enforcement		
Human resources within public forest institutions	Includes all employees of Forestry Commission.	

Other general comments to the table

16 Table T16 – Education and research

16.1 FRA 2010 Categories and definitions

Term	Definition
Annual graduation of students	Number of students that have successfully completed a Bachelor's or higher degree in forest science or achieved a certificate or diploma as forest technician.
Doctor's degree (PhD)	University (or equivalent) education with a total duration of about 8 years.
Master's degree (MSc) or equivalent	University (or equivalent) education with a total duration of about five years.
Bachelor's degree (BSc) or equivalent	University (or equivalent) education with a duration of about three years.
Technician certificate or diploma	Qualification issued from a technical education institution consisting of 1 to 3 years post secondary education.
Publicly funded forest research centers	Research centers implementing research programmes on forest matters. Funding is public or channelled through public institutions.

16.2 National data

16.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Forestry Commission	H	Data on Forest technician certificate / diploma	2000 2005 2008	

16.3 Data for Table T16

FRA 2010 Category	Annual graduation of students within the country					
	2000		2005		2008	
	Number	%Female	Number	%Female	Number	%Female
Master's degree in Forest Science	0	0	n/a	n/a	n/a	n/a
Bachelor's degree in Forest Science	0	0	n/a	n/a	n/a	n/a
Forest technician certificate / diploma	28	n/a	47	n/a	25	n/a
FRA 2010 Category	**Professionals working in public forest research centres**					
	2000		2005		2008	
	Number	%Female	Number	%Female	Number	%Female
Doctor's degree (PhD)	n/a	n/a	n/a	n/a	0	0
Master's degree (MSc) or equivalent	n/a	n/a	n/a	n/a	8	25
Bachelor's degree (BSc) or equivalent	n/a	n/a	n/a	n/a	16	31.25

16.4 Comments to Table T16

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Annual graduation of students within the country	Data from Universities was not forthcoming and so, due to transport and time constrains, this could not be incorporated into the report.	
Professionals working in public forest research centres	The available data did not include that for the years 2000 and 2005.	

Other general comments to the table

17 Table T17 – Public revenue collection and expenditure

17.1 FRA 2010 Categories and definitions

Category	Definition
Forest revenue	All government revenue collected from the domestic production and trade of forest products and services. For this purpose, forest products include: roundwood; sawnwood; wood-based panels; pulp and paper; and non-wood forest products. As far as possible, this should include revenue collected by all levels of government (i.e. central, regional/provincial and municipal level), but it should exclude the income of publicly owned business entities.
Public expenditure	All government expenditure on forest related activities (further defined below).
Operational expenditure *(sub-category to Public expenditure)*	All government expenditure on public institutions solely engaged in the forest sector. Where the forest administration is part of a larger public agency (e.g. department or ministry), this should only include the forest sector component of the agency's total expenditure. As far as possible, this should also include other institutions (e.g. in research, training and marketing) solely engaged in the forest sector, but it should exclude the expenditure of publicly owned business entities.
Transfer payments *(sub-category to Public expenditure)*	All government expenditure on direct financial incentives paid to non-government and private-sector institutions, enterprises communities or individuals operating in the forest sector to implement forest related activities.
Domestic funding	Public expenditure funded from domestic public financial resources, including: retained forest revenue; forest-related funds; and allocations from the national budget (i.e. from non-forest sector public revenue sources).
External funding	Public expenditure funded from grants and loans from donors, non-governmental organisations, international lending agencies and international organisations, where such funds are channelled through national public institutions.

17.2 National data

17.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Forestry Commission. 2000 and 2005 Annual Financial Reports	H	Forestry Revenues and Expenditures	2000, 2005	

17.2.2 Classification and definitions

National class	Definition
Forest Revenues	All government revenue collected from the domestic production and trade of forest products and services. For this purpose, forest products include: roundwood; sawnwood; wood-based panels; pulp and paper; and non-wood forest products, but this excludes the income of publicly owned business entities.
Government of Zimbabwe Grants	All government expenditure on Forestry Commission which is solely engaged in the forest sector. Includes the forest sector component of the Ministry of Environment and Tourism's total expenditure i.e research, training and marketing, but it excludes the expenditure of publicly owned business entities.
Public Expenditure	All government expenditure on forest related activities (further defined below).
Operational expenditure *(sub-category to Public expenditure)*	All government expenditure on Forestry Commission.
Transfer payments *(sub-category to Public expenditure)*	All government expenditure on direct financial incentives paid to non-government and private-sector institutions, enterprises, communities or individuals operating in the forest sector to implement forest related activities.
Domestic funding	Public expenditure funded from domestic public financial resources, including: retained forest revenue; forest-related funds; and allocations from the national budget (i.e. from non-forest sector public revenue sources).
External funding	Public expenditure funded from grants and loans from donors, non-governmental organisations, international lending agencies and international organisations, where such funds are channelled through the Forestry Commission.

17.2.3 Original data

National Class	Domestic funding (1000 local currency)		External funding (1000 local currency)		Total (1000 local currency)	
	2000	2005	2000	2005	2000	2005
Forest Revenues	143 035	60 593 959	0	0	143 035	60 593 959
Government of Zimbabwe Grants	148 661	21 906 500	0	0	148 661	21 906 500
Public Expenditure	354 999	72 975 453	0	0	354 999	72 975 453
Operational expenditure	241 932	67 892 616	0	0	241 932	67 892 616
Transfer payments	113 067	5 082 837	0	0	113 067	5 082 837

17.3 Analysis and processing of national data

17.3.1 Reclassification into FRA 2010 categories

FRA 2010 Categories	Domestic funding (1000 local currency)		External funding (1000 local currency)		Total (1000 local currency)	
	2000	2005	2000	2005	2000	2005
Operational expenditure	241 932	67 892 616	0	0	241 932	67 892 616
Transfer payments	113 067	5 082 837	0	0	113 067	5 082 837
Total public expenditure	354 999	72 975 453	0	0	354 999	72 975 453

17.4 Data for Table T17

Table 17a - Forest revenues

FRA 2010 Categories	Revenues (1000 local currency)	
	2000	2005
Forest revenue	143 035	60 593 959

Table 17b - Public expenditure in forest sector by funding source

FRA 2010 Categories	Domestic funding (1000 local currency)		External funding (1000 local currency)		Total (1000 local currency)	
	2000	2005	2000	2005	2000	2005
Operational expenditure	241 932	67 892 616	0	0	241 932	67 892 616
Transfer payments	113 067	5 082 837	0	0	113 067	5 082 837
Total public expenditure	354 999	72 975 453	0	0	354 999	72 975 453

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

17.5 Comments to Table T17

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

Other general comments to the table