Forestry Department
Food and Agriculture Organization of the United Nations

GLOBAL FOREST RESOURCES ASSESSMENT

COUNTRY REPORTS

PAPUA NEW GUINEA

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The Forest Resources Assessment Programme

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

FAO, at the request of its member countries, regularly monitors the world's forests and their management and uses through the Forest Resources Assessment Programme. This country report forms part of the Global Forest Resources Assessment 2005 (FRA 2005), which is the most comprehensive assessment to date. More than 800 people have been involved, including 172 national correspondents and their colleagues, an Advisory Group, international experts, FAO staff, consultants and volunteers. Information has been collated from 229 countries and territories for three points in time: 1990, 2000 and 2005.

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

The Global Forest Resources Assessment process is coordinated by the Forestry Department at FAO headquarters in Rome. The contact person for matters related to FRA 2005 is:

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1 Table T1 – Extent of Forest and Other wooded land

1.1 FRA 2005 Categories and definitions

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

1.2 National data

1.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
McAlpine, J. & Quigley, J. (Coffey MPW Pty. Ltd for AusAid: Canberra & Papua New Guinea National Forest Service. 1998. Forest Resources of Papua New Guinea. Summary Statistics from the Forest Inventory Mapping (FIM) System	H	Forest, OWL, Other land	1975	
McAlpine, J. & Quigley, J. (Coffey MPW Pty. Ltd for AusAid: Canberra & Papua New Guinea National Forest Service. 1998. Forest Resources of Papua New Guinea. Summary Statistics from the Forest Inventory Mapping (FIM) System	H	Forest, OWL, Other land	1996	
Papua New Guinea National Forest Authority. 2000. 1996 annual report	H	Forest (Plantations)	1996, 1997, 1998, 1999	
Papua New Guinea National Forest Authority. Forest authority database	H	Forest (Mangrove)	1996	
FAOSTAT http://apps.fao.org/faostat/form?collection=LandUse&Domain=Land&servlet=1&hasbulk=0&version=ext&language=EN	H	Total area, Land area and Indland water	1990 2000	

1.2.2 Classification and definitions

Over view: Forest and woody vegetation types (country classification)	
Low Altitude Forest on Plains and Fans	Large to medium crowned forest (P1)
	Open crowned forest (P0)
	Small crowned forest (Ps)
	Terminalia brassii forest (PTb)
Low Altitude Forest on Uplands	Large crowned forest (Hl)
	Medium crowned forest (Hm)
	Small crowned forest (Hs)
Lower Montane Forest	Small crowned forest (L)
	small crowned forest with conifers (Lc)
Montane Forest (above 3000 m) (Mo)	
Dry seasonal Forest (D)	
Littoral Forest (B)	
Seral Forest (F)	
Swamp Forest (Fsw)	
Mangrove (M)	
Woodlands (W)	
Savannah (Sa)	
Scrub (Sc)	
Grassland encompassed by FIM summary report (G)	
Other land uses	

National class	**Definition**
Large to medium crowned forest (P1)	Low altitude forest on plains and fans. Crown diameter >8m. Canopy is generally 30–35m high and irregular in both height and closure. Stem diameters generally range from large (70-89 cm) to small (30-49 cm) but very large stems (90+ cm) are not uncommon. The floristic composition is very mixed with no single-species dominance.
Open crowned forest (P0)	Low altitude forest on plains and fans. Forest has an uneven canopy up to 30 m in height with many, often large, gaps revealing a lower tree stratum. Large crowned (>15m diameter) emergents often reach 40m, rising above a canopy comprising medium (8-15m) to small (<8m) crowns. The floristic composition is very similar to the "Large to medium crowned forest".
Small crowned forest (Ps)	Low altitude forest on plains and fans. This forest type has a dense even canopy of small crowns (<8m) 25-30m in height with no emergents. Stem diameters are generally small (30-49 cm) to very small (<30 cm).
Terminalia brassii forest (PTb)	Low altitude forest on plains and fans. The forest has an even to slightly undulating canopy of large woolly crowns (>15m) 30-35m in height. The canopy is dense in a single-species stand, but may be more open when associated with Campnosperma. The majority of stems range from very large (90cm+) to medium diameter (50-69 cm).
Large crowned forest (HI)	Low altitude forest on uplands. This forest type has an uneven canopy 30-35m in height with a 60-80% closure. Emergents can reach 40m in height. Large stem diameters (70-89cm) predominant. In both structure and floristic content it is very similar to the "Large to medium crowned forest" on plains and fans.
Medium crowned forest (Hm)	Low altitude forest on uplands. The canopy of this forest type is 25-30m in height, is generally only slightly uneven and has a 60-80% crown closure. Except for Araucaria emergents rarely exceed 40m in height. Very large stem diameters (90cm+) are rare except for Araucaria. Floristically the forest is very mixed.

Small crowned forest (Hs)	Low altitude forest on uplands. This forest has a relatively even canopy 20-30m in height, with a 60-80% closure and no emergents. Large stem diameters (90cm+) are rare, the majority of trees falling into the medium (50-69cm) to small (30-49cm) classes. The forest may be either a mixed forest which is poorly developed due to adverse site or climatic conditions, or a forest win which a small crowned (<8m) trees predominates in the canopy.
Small crowned forest (L)	Lower montane forest (above 1000m). This forest has an even to slightly undulating canopy 20-30m in height. Canopy closure varies from dense to slightly open. The canopy height decreases with increasing altitude. Stem diameters are generally medium (50-69cm) to small (30-49cm). The forest occurs throughout the mountain ranges in the 1400-3400m altitude range.
Small crowned forest with conifers (Lc)	This forest has a canopy 15-25m in height with emergent conifers. Crowns are small (<8m) to very small. Although the stems of the associated broadleaf species are generally small (30-49cm) in diameter, the coniferous stems often exceed 50cm in diameter. The forest occurs in many places in the mountain ranges above 2400m altitude.
Mountane forest (above 3000m) (Mo)	This forest “mossy forest” has a dense, even, dark toned, almost velvety textured canopy 5-15m in height, usually without emergents. Stems are very thin and crooked.
Dry seasonal forest (D)	This forest has a fairly open canopy 20-25m in height with emergents to 30m and occasionally to 40m. Stems are often low-branched and crooked.
Littoral forest (B)	Contains forest classes: Mixed forest (B) The forest has an irregularly open, irregularly uneven canopy of medium (8-15m) crowns 20-30m in height. Forest with Casuarina equisetifolia (BCe): The forest has a dense to irregularly open, more or less even canopy of small (<8m) crowns 15-30m in height. Forest with Melaeuca leucandendron (BMI): The forest has an irregularly open to sometimes almost closed, irregularly uneven canopy of medium (8-15m) to small (<8m) crowns 20-30m in height.
Seral forest (F)	This forest class contains five sub-classes: Riverine mixed successions (Fri): This forest has an irregularly open to open, irregularly uneven, medium (8-15m) to small (<8m) crowned canopy up to 30m in height. Large crowned (>15m) emergents, may be present. The forest is heterogeneous, comprising many seral stages, from low forest to original levee forest, following changes in the course of a river. Riverine successions with Casuarina grandis (FriCg): This forest has a dense, even canopy of small (<8m), semi-conical crowns up to 30m in height. It is an almost pure stand of Casuarina grandis. Stem diameters are small (30-49cm). Riverine successions with Eucalyptus deglupta (FriK): This forest has a dense to open, generally even, large crowned (>15m) canopy up to 30m in height. The canopy is predominantly kamarere which has light-toned crowns. Riverine successions with Terminalia brassii (FriTb): This forest has a dense to open, even to slightly undulating, Volcanic successions (Fv): The forest is highly variable in height, crown size, canopy closure and profile, and in species composition, being a seral vegetation type. Generally it has an even canopy being composed of even-aged trees.
Swamp forest (Fsw)	This forest class contains four sub-classes: Mixed swamp forest (Fsw): The forest has an irregularly open, almost even canopy of medium (8-15m) to very small (<8m) crowns 20-30m in height. A dense under-storey of sago palms is often visible. In some intermontane basins the forest is extremely low in height, up to 5m and can be a pure stand of Nothofagus or Poducarpus. Swamp forest with Campnosperma (FswC): The forest has a dense, even canopy of small crowns 20-30m in height. Although rarely seen under the dense canopy there is a lower layer of sago palms. Swamp forest with Melaleuca leucadendron (FswML): This forest has an open, irregularly

	uneven canopy of small crowns 20-30m in height. Swamp forest with terminalia brassii (FswTb): The forest has a generally dense, occasionally open, even to slightly uneven or undulating canopy of medium (8-15m) to large (>15m), wolly, light-toned crowns 20-30m in height.
Mangrove (M)	Covers a wide range of communities from almost bare tidal flats with scattered halophytic herbs, to mangrove forest over 30m in height.
Woodlands (W)	This class contains six sub-classes: Woodland (W): The tree layer is low and open but the ground layer is usually dense and may include shrubs, herbs or grasses, or any combination of these three. Riverine succession dominated by woodland (Wri): A low open tree layer of species common to its forest counterpart. Riverine successions with casuarinas grandis woodland (WriCg): This type is a low, open version of its forested counterpart. The ground layer is generally sparse. Volcanic successions dominated by woodland (Wv): The low, open tree layer up to 8m high over a sparse to dense ground layer of grasses. Swamp woodland (Wsw): The wood land consists of an open to fairly dense upper layer of sago palms or pandans, with scattered trees, over a ground layer of tall sedges and ferns or Phragmites grass, or bare ground. Where trees occur, the species are similar to those of swamp forest. Swamp woodland with Melaleuca leucandendron (WswMI): This woodland is a very open variant of swamp forest with Melaleuca. The upper layer of very open Melaleuca leucandendron can attain a height of 20m over a dense ground layer of grasses and sedges.
Savannah (Sa)	This class contains three sub-classes: Savannah (Sa): The tree layer is low, generally less than 6m tall, and is open. The ground layer is clearly visible and is dominated by grasses with some shrubs and herbs. Savannah with gallery forest (Saf): The type of savannah present is similar to that described above for the appropriate area. Savannah with Melaleuca leucadendron (SaMI): in southwest PNG, on periodically waterlogged terrain, the tree layer is dominated by melaleuca.
Scrub (Sc)	This class contains three sub-classes: Scrub (Sc): Scrub is a community of dense shrubs up to 6m in height, with or without low scattered trees. Scrub with Bambusa and Cyathea (ScBc): Occasional low trees may be present but for the most part the scrub comprises of the tree-fern Cyathea with a tangled mass of scrambling Bambusa.
Grassland (G)	Encompassed by FIM summary report. This class contains ten sub-classes
Other land uses	Urban, agriculture, plantations grasslands, lakes etc.

1.2.3 Original data

All forests

National classes		Area (1000 ha)		
		1975	**1996**	**1996**
Low Altitude Forest on Plains and Fans	Large to medium crowned forest (P1)		798.2	
	Open crowned forest (P0)		1,252.1	
	Small crowned forest (Ps)		824.8	
	Terminalia brassii forest (PTb)	3 260.8	0	2 875.1
Low Altitude Forest on Uplands	Large crowned forest (Hl)		320.7	
	Medium crowned forest (Hm)		13, 839.4	
	Small crowned forest (Hs)	17 946.8	3, 011.0	17 171.1
Lower Montane Forest	Small crowned forest (L)		7,303.6	
	small crowned forest with conifers (Lc)	8 109.9	441.8	7 745.4
Montane Forest (above 3000 m) (Mo)		177.4	177.4	
Dry seasonal Forest (D)		1 062.9	778.6	
Littoral Forest (B)		86.5	86.5	
Seral Forest (F)		171.0	46,1	
Swamp Forest (Fsw)		2 250.3	1,267.3	
Mangrove (M)		601.6	550.0	
Woodlands (W)		2 693.8	2,693.8	
Savannah (Sa)		1 190.6	1,190.6	
Scrub (Sc)		601.4	601.4	
Grassland encompassed by FIM summary report (G)		3 241.1	3,241.1	
Other land uses[1)]		5 015.8	7,985.5	
Total area		**46 409.9**	**46 409.9**	

1) Includes: urban land, agriculture, plantations, grasslands, lakes etc.

Forest plantations (excl. rubber plantations)

State plantations	Total area planted (ha)			
	1996	**1997**	**1998**	**1999**
Province				
Central	600	600	600	600
Madang	900	900	900	900
Morobe	13 000	12 000	12 000	13 000
Milne Bay	1 500	1 500	1 500	1 500
New Ireland	250	250	250	250
Eastern Highlands	4 700	5 100	5 100	5 100
Western Highlands	2 100	2 100	2 100	2 100
Southern Highlands	900	400	400	900
Total State	***23 950***	***22 850***	***22 850***	***24 350***
Private plantations				
Madang	8 400	10 745	10 745	10 745
East New Britain	12 833	13 904	13 904	13 904
West New Britain	9 927	10 258	10 558	10 853
Central	1 200	1 200	1 200	1 200
Total private	***32 360***	***36 107***	***36 407***	***36 702***
GRAND TOTAL	**56 310**	**58 957**	**59 257**	**61 052**

1.3 Reclassification into FRA 2005 classes

The national data above were reclassified using the following reclassification matrix:

National classes	Area (1000 ha)		FRA 2005 categories		
	1975	1996	Forest	OWL	Other land
Low Altitued forests on plains and fans	3 260.8	2 875.1	100%		
Low Altitude Forest on Uplands	17 946.8	17 171.1	100%		
Lower Montane forest	8 109.9	7 745.4	100%		
Montane Forest (above 3000 m) (Mo)	177.4	177.4	100%		
Dry seasonal Forest (D)	1 062.9	778.6	100%		
Littoral Forest (B)	86.5	86.5	100%		
Seral Forest (F)	171.0	46.1	100%		
Swamp Forest (Fsw)	2 250.3	1 267.3	100%		
Mangrove (M)	601.6	550.0	100%		
Woodlands (W)	2 693.8	2 693.8		100%	
Savannah (Sa)	1 190.6	1 190.6		100%	
Scrub (Sc)	601.4	601.4		100%	
Grassland encomp. by FIM sum. Rep. (G)	3 241.1	3 241.1			100%
Other land uses	5 015.8	7 985.5			100%
TOTAL	**46 409.9**	**46 409.9**			

This reclassification results in the following table:

	1975	1996
Forest (excl. plantations)	33 667	30 698
Other wooded land	4 486	4 486
Other land (incl. water and plantations)	8 257	11 227
Total	**46 410**	**46 410**

1.4 Analysis and processing of national data

1.4.1 Calibration

Source	Total area (1000 ha)
National data	46 409.9
FAOSTAT	46 284.0
Calibration factor	*0.997287*

After applying the calibration factor, applying the inland water area from FAOSTAT and adjusting the difference to Other land, we get:

	1975	1996
Forest (excl. plantations)	33 576	30 614
Other wooded land	4 474	4 474
Other land (incl. plantations)	7 237	10 198
Inland water (from FAOSTAT)	998	998
Total after calibration	**46 284**	**46 284**

Note that the plantations are still included in “Other land”.

1.4.2 Estimation and forecasting

The calibrated data above were used for estimation and forecasting. Linear interpolation and extrapolation were used.

	1990	2000	2005
Forest (excl. plantations)	31 460	30 050	29 345
Other wooded land	4 474	4 474	4 474
Other land (incl. plantations)	9 352	10 762	11 467
Inland water	998	998	998
Total	**46 284**	**46 284**	**46 284**

In order to adjust the above data for plantation area, estimation and forecasting for plantations was done separately, based on the specific information above regarding plantations.

	Estimated rubber wood plantation (ha)		
Plantation	**1990**	**2000[1)]**	**2005**
Rubber wood[1)]	15 800	19 800	21 800
Plantations[2)]	47 000	62 600	70 500
Total	**62 800**	**82 400**	**92 300**

1) IRSG (1997 and 1999) give rubber plantation areas in 1988 and 1996. Using these figures, annual planting rate and the total plantation area for the year 2000 are estimated as 400 ha and 19 800 ha, respectively. The same estimated annual planting rate has been applied to estimate the total area of rubber wood plantations for the FRA 2005 reference years.

2) Original data figures for the years 1996-1999 gives us an estimated annual planting rate of 1580 ha per year. This annual planting rate has been applied to estimate and forecast the total area of plantations for the FRA 2005 reference years.

1.5 Data for National reporting table T1

FRA 2005 Categories	Area (1000 hectares)		
	1990	**2000**	**2005**
Forest	31523	30133	29437
Other wooded land	4474	4474	4474
Other land	9289	10680	11375
...of which with tree cover	NDA	NDA	NDA
Inland water bodies [1)]	998	998	998
TOTAL	**46 284**	**46 284**	**46 284**

[1)] Source: FAOSTAT.

1.6 Comments to National reporting table T1

Two sets of data are available. One from 1975 and one from 1996. The FIM (Forest Inventory Mapping) of Papua New Guinea is centred on forest resource and vegetation mapping at scale 1: 100 000 and covers the whole country. The baseline mapping is based on air photo interpretation of 1973-74 of similar scale. A total of 58 forest and other vegetation types are distinguished of these 35 are forest types. The information in FIM is stored as a series of map layers linked to a database.

Using mid 1996 Landsat TM images supported by ground and air surveys the 1975 forest resource map was updated to mid 1996. As included in the FIM, the updated mapping provides information on change in forest status 1975-1996 relating to logged over areas and conversion of forest areas to other land uses.

There is particular uncertainty about data from mangrove forests. There is reason to believe that the data available underestimates mangrove areas.

The figure on Other Wooded Land has been kept the same as there is no data to indicate any trend, either an increase of decrease. Expert knowledge is that the area of other wooded land would have increased as a result of shifting cultivations, forest disturbance by portable sawmilling activities, and other human and natural activities that would have disturbed the forest significantly thereby shifting it from forest to other wooded areas. Other causes may be the damage by fire during prolonged drought as in 1997.

2 Table T2 – Ownership of Forest and Other wooded land

2.1 FRA 2005 Categories and definitions

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

2.2 National data

2.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Estimates by the National Forest Service, Papua New Guinea	M	Private ownership, Public ownership	1990, 2000	

2.2.2 Classification and definitions

National class	Definition
State land	Land under state ownership
Tribal land	Land owned by indigenous/tribal peoples
Private land	Land under private ownership

2.2.3 Original data

State land	Tribal land	Long term lease (99 yrs)
3%	~96.9%	~0.1%

Note: Estimated by the National Forest Service

2.3 Analysis and processing of national data

The percentages above were applied to the data on Forest and Other wooded land from T1, which gives the following figures:

	Forest		Other wooded land	
National class	**1990**	**2000**	**1990**	**2000**
State land	946	904	134	134
Tribal land	30 546	29 198	4 335	4 335
Long term lease	32	30	4	4
Total	**31 523**	**30 133**	**4 474**	**4 474**

2.4 Reclassification into FRA 2005 classes

National class	FRA 2005 Categories		
	Private ownership	**Public ownership**	**Other ownership**
State land		100%	
Tribal land			100%
Long term lease		100%	

2.5 Data for National reporting table T2

FRA 2005 Categories	Area (1000 hectares)			
	Forest		Other wooded land	
	1990	**2000**	**1990**	**2000**
Private ownership	0	0	0	0
Public ownership	977	934	139	139
Other ownership	30 546	29 198	4 335	4 335
TOTAL	**31 523**	**30 133**	**4 474**	**4 474**

2.6 Comments to National reporting table T2

Most is not most of the land in Papua New Guinea is customary owned and this constitutes an estimated 96.9% of the country's landmass including inland water bodies. Tribal in the sense that clan groups own the land and not individuals although individual ownership is on the rise but there is no way of determining the hectarage.

The long term lease (0.1%) is mostly companies that have embarked on reforestation and have exclusive rights to the timber crop however not the land on which it is using to grow the trees. Long term 99yr lease is being entered into between the State and Landowners to facilitate the reforestation projects by the timber companies.

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

3.1 FRA 2005 Categories and definitions

Types of designation

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

Designation categories

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

3.2 National data

3.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
McAlpine, J. & Quigley, J. (Coffey MPW Pty. Ltd for AusAid: Canberra & Papua New Guinea National Forest Service. 1998. Forest Resources of Papua New Guinea. Summary Statistics from the Forest Inventory Mapping (FIM) System	H	Production, Protection, Conservation	1975, 1996	

3.2.2 Classification and definitions

National class	Definition
Concession area	Includes areas for which the acquisition of timber rights has been approved under the current and previous Forestry Acts. Thus includes Timber Rights Purchase agreements, Forest Management Areas and Local Forest agreements. Areas do not cover logging arrangements on land acquired under Lands Act provisions or informal logging in local areas such as by portable sawmills "wokabaut somils"
Extreme constraint to logging	Includes: Land with over 30 degrees dominant slope or Land over 2400m altitude or Land with polygonal karst landform or Land permanently or near permanently inundated extending over more than 80% of the area of that land or Land covered by mangroves
Serious constraints to logging	Includes: Land with dominant slope of 20-30 degrees and sub-dominant slope over 30 degrees and with high to very high relief or Land permanently or near permanently inundated extending over 50-80% of the area of that land
Protected areas	Includes areas declared as Protected area under the Flora and Fauna Act (e g Wildlife management areas, National parks, Catchment management areas) Also by virtue of their location, topographic constraints, and ecological, cultural or environmental considerations.
Production Forests	Areas that have legally been acquired by the State for timber production. Includes all the Timber Rights Purchase (TRP), Local Forest Areas (LFA) and Forest Management Agreement (FMA) areas
Future Productions Forests	Areas identified as potential for timber harvesting in the long term under legal concession arrangements such as a Forest Management Agreement (FMA) or Timber Authority (TA)
Reserve Forests	Forest Areas not yet otherwise classified but upon which a decision will be made later
Salvage Forests	Forest Areas to be cleared for other land uses.
Afforestation	Land that is identified for afforestation and includes most of the grasslands in the country

Note: If different national data sources use different classes and definitions, a table such as above is needed for each relevant data source.

3.2.3 Original data

FIM Based 1996

	Area (1000 hectares)							
Province	Gross Area	Production	Future Production	Reserve Forest	Protection Forest	Afforestation & Salvage potential	Other Areas	Sub-total
Western	9,845.21	1,558.13	1,363.07	3,180.64	63.48	1,938.87	1,741.02	9,845.21
Gulf	3,840.07	1,627.5	214.52	858.69	0.47	180.37	598.52	3,480.07
Central	2,987.18	315.16	699.6	881.08	2.99	570.99	517.37	2,987.18
Milne Bay	1,426.4	151.94	191.19	480.96	20.32	285.89	296.11	1,426.4
Northern	2,277.22	159.92	979.54	638.48	0	298.69	200.59	2,277.22
SHP	2,574.83	21.45	342.78	1,555.19	4.48	162.63	488.3	2,574.83
Enga	1,182.66	31.27	165.77	554.98	0	32.25	398.39	1,182.66
WHP	914.12	59.12	45.51	298.62	0	104.88	405.99	914.12
Simbu	613.36	0	186.72	195.45	90.38	23.02	117.8	613.36
EHP	1,150.51	0	0	746.47	0.19	195.65	178.2	1,150.51
Morobe	3,393.29	161.92	203.96	1,635.01	2.69	1,066.34	323.36	3,393.29
Madang	2,909.53	147.45	288.55	1,132.19	163.99	239.44	937.91	2,909.53
ESP	4,381.32	401.28	614.17	914.41	157.37	320.47	1,973.62	4,381.32
WSP	3,605.39	501.62	1,296.75	1,153.78	0	254.59	398.66	3,605.39
Manus	215.03	20.68	147.73	2.7	0	14.7	29.22	215.03
NIP	961.03	149.78	234.37	92.06	1.52	361.84	121.46	961.03
ENB	1,534.36	306.49	354.07	352.19	0	284.47	237.13	1,534.36
WNB	2,045.59	563.54	243.37	192.94	13.77	789.86	242.11	2,045.59
NSP	943.27	0	0	683.25	25.05	27.09	207.88	943.27
Total	**46,410.37**	**6,177.25**	**7,571.67**	**15,549.09**	**546.7**	**7,152.04**	**9,413.64**	**46,410.39**

Figures in the above Table are not calibrated.

3.3 Analysis and processing of national data

3.3.1 Calibration

Applied to only the TOTAL of the above Table for easy of computation. It is assumed that Other wooded land is included in the national category "Afforestation & salvage potential". The T1 area Other wooded land (4 474 (000) ha is thus subtracted from this category giving the following results for 1996:

	Area (1000 hectares and %)					
	Production	Future Production	Reserve Forest	Protection Forest	Afforestation & Salvage potential (less OWL)	Other Forest area
Total	6,177.25	7,571.67	15,549.09	546.7	2,678.04	9,413.64
%	14.73	18.06	37.08	1.30	6.39	22.45

3.3.2 Estimation and forecasting

The above percentages have been applied to the Forest area excluding plantations from T1.

3.4 Reclassification into FRA 2005 classes

Step 1 reclassification

National class	%	Area 1000 hectares		
		1990	**2000**	**2005**
		T1 Forest area: 31460	*T1 Forest area: 30050*	*T1 Forest area: 29345*
Production	14.7	4634	4420	4323
Future production	18.1	5680	5417	5298
Reserve forest	37.1	11665	11125	10880
Protection forest	1.3	410	391	383
Aff. & Salv. pot.	6.4	2009	1916	1874
Other areas	22.5	7062	6735	6587
Total	100	31460	30005	29345

Step 2 reclassification

Reclassification matrix for reporting year 1990

National class	FRA 2005 categories					
	Prod.	**Prot.**	**Cons. Biodiv.**	**Soc. Serv.**	**Multiple**	**No unknown Other land**
Production[1]	85%				15%	
Future production						100%
Reserve forest						100%
Protection Forest			100%			
Afforestation & Salvage potential						100%
Other areas						100%

Reclassification matrix for the reporting years 2000 and 2005

National class	FRA 2005 categories					
	Prod.	**Prot.**	**Cons. Biodiv.**	**Soc. Serv.**	**Multiple**	**No unknown**
Production[1]	75%		10%		15%	
Future production	75%		10%		15%	
Reserve forest						100%
Protection Forest			100%			
Afforestation & Salv. Pot.						100%
Other areas						100%

[1] In timber production areas it is now mandatory that 10% be set aside for biodiversity conservation, and a further 15% being set aside to cater for buffer zones along creeks and watershed management and to act as village reserves and other social services. Again this is an arbitrary percent. The total of 25% only came into effect in Year 2000 and prior to that only 15% was being reserved for buffer zones etc.

In addition to the above, all plantation areas have been reclassified as production forests and added to this category.

Plantation	Estimated rubber wood plantation (ha)		
	1990	**2000[1)]**	**2005**
Rubber wood[1)]	15 800	19 800	21 800
Plantations[2)]	47 000	62 600	70 500
Total	**62 800**	**82 400**	**92 300**

3.5 Data for National reporting table T3

FRA 2005 Categories / Designated function	Area (1000 hectares)					
	Primary function			Total area with function		
	1990	2000	2005	1990	2000	2005
Forest						
Production	4002	7471	7308	NDA	NDA	NDA
Protection of soil and water	ID	ID	ID	NDA	NDA	NDA
Conservation of biodiversity	410	1377	1345	NDA	NDA	NDA
Social services	ID	ID	ID	NDA	NDA	NDA
Multiple purpose	695	1478	1443	not appl.	not appl.	not appl.
No or unknown function	26416	19806	19341	not appl.	not appl.	not appl.
Total – Forest	**31523**	**30132**	**29437**	**not appl.**	**not appl.**	**not appl.**
Other wooded land						
Production	NDA	NDA	NDA	NDA	NDA	NDA
Protection of soil and water	NDA	NDA	NDA	NDA	NDA	NDA
Conservation of biodiversity	NDA	NDA	NDA	NDA	NDA	NDA
Social services	NDA	NDA	NDA	NDA	NDA	NDA
Multiple purpose	NDA	NDA	NDA	not appl.	not appl.	not appl.
No or unknown function	4474	4474	4474	not appl.	not appl.	not appl.
Total – Other wooded land	**4 474**	**4 474**	**4 474**	**not appl.**	**not appl.**	**not appl.**

3.6 Comments to National reporting table T3

There is no data available on Other Wooded Land.

4 Table T4 – Characteristics of Forest and Other wooded land

4.1 FRA 2005 Categories and definitions

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

4.2 National data

4.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
FIM Reports	H		1996	

4.2.2 Classification and definitions

National class	Definition
Primary	All Potential Forest Areas designated in the National Forest Plan for timber production, but not yet logged.
Modified Secondary	All areas under some form of legal acquisition either as Timber Rights Purchase and Local Forest Areas that have been acquired and either being logged or have been logged out.

4.2.3 Original data

Table T1 has been used as inputs along with information on the FIM based reports on the area of forest subject to use either through logging or other human intervention.

4.3 Analysis and processing of national data

4.3.1 Calibration

4.3.2 Estimation and forecasting

4.4 Reclassification into FRA 2005 classes

All areas subject to logging or other human intervention have been reclassified as modified natural and all plantations as productive plantations. The remaining area has be classified as primary.

4.5 Data for National reporting table T4

FRA 2005 Categories	Area (1 000 hectares)					
	Forest			Other wooded land		
	1990	2000	2005	1990	2000	2005
Primary	29210	26462	25211	NDA	NDA	NDA
Modified natural	2250	3588	4134	NDA	NDA	NDA
Semi-natural				NDA	NDA	NDA
Productive plantation	62.8	82.4	92.3	NDA	NDA	NDA
Protective plantation				NDA	NDA	NDA
TOTAL	**31523**	**30132**	**29437**	**4474**	**4474**	**4474**

4.6 Comments to National reporting table T4

The data presented above is derived from the FIM based Reports.
Modified natural is all the area that had been subjected to landuse either through logging and or other human intervention.

5 Table T5 – Growing stock

5.1 FRA 2005 Categories and definitions

Category	Definition
Growing stock	Volume over bark of all living trees more than X cm in diameter at breast height (or above buttress if these are higher). Includes the stem from ground level or stump height up to a top diameter of Y cm, and may also include branches to a minimum diameter of W cm.
Commercial growing stock	The part of the growing stock of species that are considered as commercial or potentially commercial under current market conditions, and with a diameter at breast height of Z cm or more.

5.2 National data

5.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
McAlpine, J. & Quigley, J. (Coffey MPW Pty. Ltd for AusAid: Canberra & Papua New Guinea National Forest Service. 1998. Forest Resources of Papua New Guinea. Summary Statistics from the Forest Inventory Mapping (FIM) System	H	Growing stock	1975, 1996	

5.2.2 Classification and definitions

National class	Definition
Gross volume	Includes all trees measuring 50 cm+ at diameter breast height in all forest area
Commercial growing stock	No national definition exists

5.2.3 Original data

	Million cubic meters (o.b.)	
Years	**1975**	**1996**
Gross volume, natural forests	1181.7	1069.5

For plantations, a growing stock of 150 m3/ha (expert estimate) is used.

5.3 Analysis and processing of national data

5.3.1 Estimation and forecasting

	Million cubic meters (o b)				
Years	***1975***	***1996***	**1990**	**2000**	**2005**
Natural Forests [1)]	*1181.7*	*1069.5*	1101.6	1048.1	1021.4
Plantations [2)]			9.4	12.4	13.8
Total Growing stock			**1 111.0**	**1 060.5**	**1 035.2**

1) Estimated/forecasted with linear interpolation and extrapolation
2) Calculated by multiplying 150 m3/ha with forest area from table T1

5.4 Reclassification into FRA 2005 classes

National class	FRA 2005 Category	
	Growing stock	**Commercial growing stock[1)]**
Gross volume	100%	50%
Volume plantations	100%	100%

[1)] It is assumed that 50% of the growing stock is made up of commercial species under current market conditions and no legal or other specific restriction would prevent utilizing this stock.

5.5 Data for National reporting table T5

FRA 2005 Categories	Volume (million cubic meters over bark)					
	Forest			Other wooded land		
	1990	**2000**	**2005**	**1990**	**2000**	**2005**
Growing stock	1111.0	1060.5	1035.2			
Commercial growing stock	560.2	536.4	524.6			

Specification of country threshold values	Unit	Value	Complementary information
1. Minimum diameter at breast height of trees included in Growing stock (X)	cm	50	
2. Minimum diameter at the top end of stem (Y) for calculation of Growing stock	cm		Up to first main branch
3. Minimum diameter of branches included in Growing stock (W)	cm		No branches included
4. Minimum diameter at breast height of trees in Commercial growing stock (Z)	cm	50	
5. Volume refers to "Above ground" (AG) or "Above stump" (AS)	AG / AS	AS	
6. Have any of the above thresholds (points 1 to 4) changed since 1990	Yes/No	No	
7. If yes, then attach a separate note giving details of the change	Attachment		

5.6 Comments to National reporting table T5

The values of growing stock are limited to only the trees having a breast height diameter of 50 cm and above. This is an underestimation of the true growing stock as trees less than 50cm have not been taken into account. Estimates of trees from 20cm dbh up to 49cm dbh indicate there is about 50-60m^3 or more per hectare. There is information on the 20-49cm dbh growing stock but again it is project specific.

6 Table T6 – Biomass stock

Due to the high species mix in the tropical moist forest it does not make sense to use the Default values in Appendix 5 of Guidelines for Country Reporting to FRA 2005 to calculate biomass.

7 Table T7 - Carbon stock

Due to the high species mix in the tropical moist forest it does not make sense to use the Default values in Appendix 5 of Guidelines for Country Reporting to FRA 2005 to calculate carbon.

8 Table T8 – Disturbances affecting health and vitality

No information has been found to support estimates of Disturbances affecting health and vitality.

9 Table T9 – Diversity of tree species

No information has been found to support estimates of diversity of tree species.

10 Table T10 – Growing stock composition

No information has been found to support estimates of the growing stock composition.

11 Table T11 – Wood removal

11.1 FRA 2005 Categories and definitions

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

11.2 National data

11.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Papua New Guinea Forest Authority. 1999 Annual Report		Wood removal	1995-1996	
Papua New Guinea Forest Authority. 2004. Forest Authority database		Wood removal	1997-2003	
FAOSTAT		Woodfuel removal	1990, 2000	

11.3 Original data

Industrial round wood

Year	Actual annual harvest (million m^3 ob)
1995	1.210
1996	2.000
1997	3.280
1998	1.689
1999	2.309
2000	2.136
2001	1.646
2002	2.140
2003	2.001

Information on woodfuel is taken from the FAOSTAT database. It reports 5.533 million m3 u.b. for all relevant reporting years, which correspond to 6.363 million m3 over bark, applying a bark factor of 1.15.

11.4 Analysis and processing of national data

11.4.1 Estimation and forecasting

The reported value for 1996 is an average for the three year period (1995-1997). The value for 2000 is the average of 1998-2002. 1990 is derived through linear extrapolation of 1996 & 2000 values. 2005 is represented by the latest available figure (2003).

	Million cubic meters ob.			
	1990	***1996***	**2000**	**2005**
Actual harvest	2.432	*2.163*	1.984	2.001

11.5 Data for National reporting table T11

FRA 2005 Categories	**Volume in 1000 cubic meters of roundwood over bark**					
	Forest			**Other wooded land**		
	1990	**2000**	**2005**	**1990**	**2000**	**2005**
Industrial roundwood	2432	1984	2001[1)]	NDA	NDA	NDA
Woodfuel	6363	6363	6363	NDA	NDA	NDA
TOTAL for Country	**8 795**	**8 347**	**8 364**	**NDA**	**NDA**	**NDA**

[1)] 2003 value

12 Table T12 – Value of wood removal

12.1 FRA 2005 Categories and definitions

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

12.2 National data

12.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Papua New Guinea Forest Authority. 1999 Annual Report		Value of industrial round wood removal	1995, 1996	
Papua New Guinea Forest Authority. 2004. Forest Authority database		Value of industrial round wood removal	1997-2003	

12.2.2 Classification and definitions

12.2.3 Original data

Year	Timber Royalty (million Kina) Industrial Roundwood
1995	12.1
1996	20.0
1997	32.3
1998	16.1
1999	17.5
2000	23.6
2001	10.5
2002	16.4
2003	21.1

No data is available on Woodfuel.

12.3 Analysis and processing of national data

12.3.1 Estimation and forecasting

The reported value for 1996 is an average for the three year period (1995-1997). The value for 2000 is the average of 1998-2002. 1990 is derived through linear extrapolation of 1996 & 2000 values. 2005 is represented by the latest available figure (2003).

	1990	***1996***	**2000**	**2005**
Value (million Kina)	28.44	*21.47*	16.82	21.10
Exchange rate (Kina/USD)	0.953		3.072	3.333
Value (million USD)	29.84		5.48	6.33

The exchange rate in Appendix 4 in the Guidelines for Country Reporting to FRA 2005 was applied.

12.4 Data for National reporting table T12

FRA 2005 Categories	**Value of roundwood removal (1 000 USD)**					
	Forest			**Other wooded land**		
	1990	**2000**	**2005**	**1990**	**2000**	**2005**
Industrial roundwood	29840	5480	6330	NDA	NDA	NDA
Woodfuel	NDA	NDA	NDA	NDA	NDA	NDA
TOTAL for Country	**29 840**	**5 480**	**6 330**	**NDA**	**NDA**	**NDA**

[1)] 2003 value

12.5 Comments to National reporting table T12

The prices have been fairly stable in local currency. The steep decline in the final table depends on the exchange rates.

13 Table T13 – Non-wood forest product removal

No information has been found to support estimates of the value of non-wood forest products removal.

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

No information has been found to support estimates of the value of non-wood forest products removal.

15 Table T15 – Employment in forestry

15.1 FRA 2005 Categories and definitions

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

15.2 National data

15.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
PNG Forest Industries Association	M		1990 / 2000	
PNG Forest Authority Internal Reports	H		1990 / 2000	

15.2.2 Original data

Category	1990	2000
Primary production of goods	8,280	7,820
Provision of services	837	548
Unspecified forestry activities	3,850	2,280

15.3 Data for National reporting table T15

FRA 2005 Categories	Employment (1000 person-years)	
	1990	2000
Primary production of goods	8.28	7.82
Provision of services	0.84	0.55
Unspecified forestry activities	3.85	2.28
TOTAL	**12.98**	**10.65**

15.4 Comments to National reporting table T15

The figure being reported was sourced from the Forest Industries Association and also from the PNG Forest Authority.