



**Forestry Department**

**Food and Agriculture Organization of the United Nations**

**GLOBAL FOREST RESOURCES  
ASSESSMENT 2010**

**COUNTRY REPORT**

**PAPUA NEW GUINEA**

FRA2010/161  
Rome, 2010



## 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](http://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.

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

## 1.2 National data

### 1.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
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 <a href="http://apps.fao.org/faostat/form?collection=LandUse&amp;Domain=Land&amp;servlet=1&amp;hsbulk=0&amp;version=ext&amp;language=EN">http://apps.fao.org/faostat/form?collection=LandUse&amp;Domain=Land&amp;servlet=1&amp;hsbulk=0&amp;version=ext&amp;language=EN</a>	H	Total area, Land area and Inland water	1990 2000	

## 1.2.2 Classification and definitions

<b>Over view:</b> 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)
	<i>Terminalia brassii</i> 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 FIMS 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).
<i>Terminalia brassii</i> 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 <i>Camptosperma</i> . The majority of stems range from very large (90cm+) to medium diameter (50-69 cm).
Large crowned forest (Hl)	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 <i>Araucaria</i> emergents rarely exceed 40m in height. Very large stem diameters (90cm+) are rare except for <i>Araucaria</i> . 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 in 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.
Montane 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 <i>Casuarina equisetifolia</i> (BCe): The forest has a dense to irregularly open, more or less even canopy of small (<8m) crowns 15-30m in height. Forest with <i>Melaleuca leucandendron</i> (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 <i>Casuarina grandis</i> (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 <i>Casuarina grandis</i> . Stem diameters are small (30-49cm). Riverine successions with <i>Eucalyptus deglupta</i> [commonly known in PNG as <i>Kamarere</i> ] (FriK): This forest has a dense to open, generally even, large crowned (>15m) canopy up to 30m in height. The canopy is predominantly <i>Kamarere</i> which has light-toned crowns. Riverine successions with <i>Terminalia brassii</i> (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 <i>Nothofagus</i> or <i>Podocarpus</i> .

	Swamp forest with <i>Campnosperma</i> (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 <i>Melaleuca leucadendron</i> (FswML): This forest has an open, irregularly uneven canopy of small crowns 20-30m in height. Swamp forest with <i>terminalia brassii</i> (FswTb): The forest has a generally dense, occasionally open, even to slightly uneven or undulating canopy of medium (8-15m) to large (>15m), woolly, 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 <i>Casuarinas grandis</i> 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 <i>Melaleuca leucandendron</i> (WswMI): This woodland is a very open variant of swamp forest with <i>Melaleuca</i> . The upper layer of very open <i>Melaleuca leucandendron</i> 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 <i>Melaleuca leucadendron</i> (SaMI): in southwest PNG, on periodically waterlogged terrain, the tree layer is dominated by <i>Melaleuca</i> .
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 <i>Bambusa</i> and <i>Cyathea</i> (ScBc): Occasional low trees may be present but for the most part the scrub comprises of the tree-fern <i>Cyathea</i> with a tangled mass of scrambling <i>Bambusa</i> .
Grassland (G)	Encompassed by FIMS 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)	3 260.8	798.2	2 875.1
	Open crowned forest (P0)		1,252.1	
	Small crowned forest (Ps)		824.8	
	<i>Terminalia brassii</i> forest (PTb)		0	
Low Altitude Forest on Uplands	Large crowned forest (Hl)	17 946.8	320.7	17 171.1
	Medium crowned forest (Hm)		13, 839.4	
	Small crowned forest (Hs)		3, 011.0	
Lower Montane Forest	Small crowned forest (L)	8 109.9	7,303.6	7 745.4
	small crowned forest with conifers (Lc)		441.8	
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 <sup>1)</sup>		5 015.8	7,985.5	
<b>Total area</b>		<b>46 409.9</b>	<b>46 409.9</b>	

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
<b>Total State</b>	<b>23 950</b>	<b>22 850</b>	<b>22 850</b>	<b>24 350</b>
<b>Private plantations</b>				
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
<b>Total private</b>	<b>32 360</b>	<b>36 107</b>	<b>36 407</b>	<b>36 702</b>
<b>GRAND TOTAL</b>	<b>56 310</b>	<b>58 957</b>	<b>59 257</b>	<b>61 052</b>

### 1.3 Analysis and processing of national data

#### 1.3.1 Reclassification

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

National classes	Area (1000 ha)		FRA 2010 categories		
	1975	1996	Forest	OWL	Other land
Low Altituded 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%
<b>TOTAL</b>	<b>46 409.9</b>	<b>46 409.9</b>			

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
<b>Total</b>	<b>46 410</b>	<b>46 410</b>

#### 1.3.2 Calibration

Source	Total area (1000 ha)
National data	46 409.9
FAOSTAT	46 284.0
<i>Calibration factor</i>	<i>0.997287</i>

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
<b>Total after calibration</b>	<b>46 284</b>	<b>46 284</b>

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

### 1.3.3 Estimation and forecasting

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

	1990	2000	2005	2010
Forest (excl. plantations)	31 460	30 050	29 345	28 640
Other wooded land	4 474	4 474	4 474	4 474
Other land (incl. plantations)	9 352	10 762	11 467	12 172
Inland water	998	998	998	998
<b>Total</b>	<b>46 284</b>	<b>46 284</b>	<b>46 284</b>	<b>46 284</b>

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.

Plantation	Estimated rubber wood plantation (ha)			
	1990	2000	2005	2010
Rubber wood <sup>1)</sup>	15 800	19 800	21 800	23 800
Plantations <sup>2)</sup>	47 000	62 600	70 500	63 200
<b>Total</b>	<b>62 800</b>	<b>82 400</b>	<b>92 300</b>	<b>86 100</b>

- 1) The same annual planting rate (400 ha/year) in FRA 2000 and FRA 2005 have been applied to estimate the area of rubber plantations for the FRA 2010 reference years.
- 2) The plantation area for the reporting year 2005 in FRA 2005 was estimated at 70 500 ha (excluding rubber plantations), however PNGFA internal report indicated no significant increase from 2000, however noted the planting rate between 2005 and 2008 of about 0.2 ha per year. It is also assumed that the plantation rate for 2009 and 2010 will remain at 200 hectares/year. This rate has been used to estimate the area of plantations for 2010 reference years.

### 1.4 Data for Table T1

FRA 2010 categories	Area (1000 hectares)			
	1990	2000 <sup>1)</sup>	2005 <sup>1)</sup>	2010 <sup>2)</sup>
Forest	31 523	30 133	29 437	28 726
Other wooded land	4 474	4 474	4 474	4 474
Other land	9 289	10 679	11 375	12 086
...of which with tree cover	n.a.	n.a.	n.a.	n.a.
Inland water bodies	998	998	998	998
<b>Total for country</b>	<b>46 284</b>	<b>46 284</b>	<b>46 284</b>	<b>46 284</b>

- 1) The changes in figures for 'Other land' reported in FRA 2005 for reporting years 2000 and 2005 are just arithmetical corrections and typo errors.
- 2) The estimates for 2010 are based on the forecasted trend that the area of natural forests will decline due to land use changes, which may increase the area of plantations.

## 1.5 Comments to Table T1

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Forest	A new report published by the University of Papua New Guinea Remote Sensing Centre in June 2008 titled “The State of the forests of Papua New Guinea” estimated PNG’s forest cover to be 28.251 million hectares. The figures reported above are from the PNG Forest Authorities Forest Inventory Mapping Systems.	The trends between 2005 to 2010 is estimated to be -0.5%; the decrease is mainly explained by increased allocation of 10 new timber concession projects and the increase in forest clearing for agricultural projects. The University Report referred to reports an annual rate of about 1.41%.
Other wooded land		
Other land	There is no data to adequately capture this hence the loss in forest and other wooded land is included in this category.	Between 2005 to 2010, it is anticipated that there will be annual increase of 139,000ha in this category.
Other land with tree cover	There is no data available on this.	
Inland water bodies	There has been no change to this figure as no new dams or large water bodies have been built or formed	

### Other general comments to the table

Two sets of data are available. One from 1975 and one from 1996. The FIMS (Forest Inventory Mapping Systems) 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 FIMS, 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 uncertainty about data from mangrove forests. There is reason to believe that the data available underestimates mangrove areas.

### Expected year for completion of ongoing/planned national forest inventory and/or RS survey / mapping

Field inventory	There is some urgency in conducting a full scale national forest inventory given the global discussions on climate change and the role that forest can play in moderating its effect. Interest have been shown by the ITTO to consider PNG as a case study for a Multipurpose National Forest Inventory (MNFI) but there is uncertainty about when this will take place.
Remote sensing survey / mapping	There are some interest on Remote Sensing and Mapping and with the possible acceptance of Reduced Emissions from Deforestation and Degradation (REDD), there may be some activities using this technology in PNG in the not too distant future.

## 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 <i>(sub-category of Private ownership)</i>	Forest owned by individuals and families.
Private business entities and institutions <i>(sub-category of Private ownership)</i>	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 <i>(sub-category of Private ownership)</i>	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 <i>(sub-category of Private ownership)</i>	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.
<b>Categories related to the holder of management rights of public forest resources</b>	
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
Internal PNG Forest Authority Reports	H	Forest Acquisition	1993-2008	
Internal PNG Forest Authority Reports	H	Forest Plantations	1993-2008	
Expert Estimate	M			

### 2.2.2 Classification and definitions

National class	Definition
Customary Ownership	Land and Forest owned by clans
Private	Limited to forest plantations planted by private companies
State	Plantations owned by the government

### 2.2.3 Original data

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

Note: Estimated by the National Forest Service

## 2.3 Analysis and processing of national data

There are only two category of land tenure system in PNG; state land and customary land. Therefore the percentages above have been adjusted to just 3% for state land and 97% for tribal land. There is no such land category as 99 year lease – the state land are leased for a period of 99 years to a third party.

National Class	Forest (1000 ha)			Other Wooded Land (1000 ha)		
	1990	2000	2005	1990	2000	2005
State land*	946	904	883	134	134	134
Tribal land	30 546	29 199	28 554	4 340	4 340	4 340
Long term lease	0	0	0	0	0	0
<b>Total</b>	<b>31 523</b>	<b>30 133</b>	<b>29 437</b>	<b>4 474</b>	<b>4 474</b>	<b>4 474</b>

### 2.3.1 Estimation and forecasting

National Class	Forest (1000 ha)				Other Wooded Land (1000 ha)			
	1990	2000	2005	2010	1990	2000	2005	2010
State land*	946	904	883	862	134	134	134	134
Tribal (Customary) land	30 546	29 199	28 554	27 880	4 340	4 340	4 340	4 340
Long term lease	0	0	0	0	0	0	0	0
<b>Total</b>	<b>31 492</b>	<b>30 103</b>	<b>29 437</b>	<b>28 742</b>	<b>4 474</b>	<b>4 474</b>	<b>4 474</b>	<b>4 474</b>

\* Generally referred to as State Land

### 2.3.2 Reclassification into FRA 2010 categories

National Class	FRA 2010 Categories		
	Private Ownership	Public Ownership	Other Ownership
State land		100%	
Tribal land	100 %		
Long term lease			

### 2.4 Data for Table T2

Table 2a - Forest ownership

FRA 2010 Categories	Forest area (1000 hectares)			
	1990	2000	2005	2010 <sup>3</sup>
Public ownership <sup>1</sup>	946	904	883	883
Private ownership	30 577	29 229	28 554	28 554
...of which owned by individuals*	0	0	0	0
...of which owned by private business entities and institutions	0	0	0	0
...of which owned by local communities	0	0	0	0
...of which owned by indigenous / tribal communities <sup>2</sup>	30 577	29 229	28 554	28 554
Other types of ownership	0	0	0	0
<b>TOTAL</b>	<b>31 523</b>	<b>30 133</b>	<b>29 437</b>	<b>29 437</b>

Notes:

1. Public ownership here is referring to land that have been acquired by the state (PNG Government).
2. These are land owned by tribal/clan groups under customary ownership rights.

A trend is emerging in PNG where individuals are buying land from the tribal/clan groups for their individual use, however there is no specific data to show the percentage or actual area sizes.

3. It is perceived that the current sizes of the different category of forest ownership will increase in 2010.

Does ownership of trees coincide with ownership of the land on which they are situated?		Yes
	x	No
If <b>No</b> above, please describe below how the two differ:		
It is estimated that all or at least 97% of the land in PNG is owned by indigenous / tribal communities and only about 3% is owned by the Government. This means that the forest growing on it is also owned by the same group of people. Where there is a forest concession or forest plantation, the rights to the trees is then vested in either the State or the private entity but the land rights is with the indigenous people.		

**Table 2b - Holder of management rights of public forests**

FRA 2010 Categories	Forest area (1000 hectares)		
	1990	2000	2005
Public Administration	917	865	844
Individuals	0	0	0
Private corporations and institutions	29	39	39
Communities	0	0	0
Other	0	0	0
<b>TOTAL</b>	<b>946</b>	<b>904</b>	<b>883</b>

**2.5 Comments to Table T2**

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Public ownership	The data given are for land areas that are owned by the state (3 %).	There has been a slight decline in land area under state ownership due to some of these areas reverting to customary/tribal ownership.
Private ownership	Includes mostly the forest plantations and the trees that are grown and owned by private forest based companies	The data is consistent as there had not been any significant new areas acquired for plantations (reforestation).
Other types of ownership		
Management rights	The data reported is for all timber concessions where the management rights had been transferred from the indigenous people to the State and onto the timber companies. In areas where the concession term have expired, the rights have reverted back to the indigenous owners.	There is a decrease in the area under management rights held by public administration as timber concessions are expiring and the rights reverting to the customary owners. This trend will continue into the future.

Other general comments to the table



### 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.
<b>Categories of primary designated functions</b>	
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.
<b>Special designation and management categories</b>	
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 sustainable 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
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) <sup>1</sup> , Local Forest Areas (LFA) <sup>2</sup> 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.
Permanent Forest Estate	Forest areas on state land that are under a 99 year lease mainly as ‘plantations’
Forest area within Protected areas	Areas that are identified for some form of management, including domestic use by the local communities aside from being completely protected as defined under ‘Protected Areas’.
Forest area under Sustainable Forest Management	Areas that have been acquired by the State under the Forestry Act for timber production purposes as defined under ‘Production Forests’, but excluding those acquired under Local Forest Areas for periods ranging from 10 to 50 years.
Forest area with Management Plan	Areas under Sustainable Forest Management for which an operating authority (Timber Permit) has been allocated to an operator ranging from 10 to 35 years period.

## Notes:

- 1 This was the mechanism applied in acquiring forest resources from customary landowners prior to the enactment and application of the current Forestry Act - *Forestry Act, 1991 (as amended)*. Some forest areas acquired under this mechanism are still valid and in operation as if were activated under the *Forestry Act, 1991 (as amended)*.
- 2 This mechanism enables customary landowners to deal directly with an investor to harvest their forest areas through a declaration under the *Forestry (Private Dealings) Act, 1971*, with no time specification.

This Act has been repealed however, some of the areas are still in operation as if were activated under the *Forestry Act, 1991 (as amended)*.

### 3.2.3 Original data

Based on FIMS, 1996

Province	Area (1000 hectares)							
	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	1 426.40	151.94	191.19	480.96	20.32	285.89	296.11	1 426.40
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
<b>Total</b>	<b>46 410.37</b>	<b>6 177.25</b>	<b>7 571.67</b>	<b>15 549.09</b>	<b>546.7</b>	<b>7 152.04</b>	<b>9 413.64</b>	<b>46 410.39</b>

Figures in the above table are not calibrated.

### 3.3 Analysis and processing of national data

#### 3.3.1 Calibration

Applied only to the TOTAL of the Table for ease 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.

### 3.3.3 Reclassification into FRA 2010 categories

#### Step 1 reclassification

National class	%	Area 1 000 hectares			
		1990	2000	2005	2010
		<i>T1 Forest area (excl. plantations): 31 460</i>	<i>T1 Forest area (excl. plantations): 30 050</i>	<i>T1 Forest area (excl. plantations): 29 345</i>	<i>T1 Forest area (excl. plantations): 28 640</i>
Production	14.7	4 625	4 417	4 314	4 210
Future production	18.1	5 694	5 439	5 311	5 184
Reserve forest	37.1	11 672	11 149	10 887	10 625
Protection forest	1.3	409	391	381	372
Aff. & Salv. pot.	6.4	2 013	1 923	1 878	1 833
Other areas	22.4	7 047	6 731	6 573	6 415
Total	100	31 460	30 050	29 345	28 640

#### Step 2 reclassification

##### Reclassification matrix for reporting year 1990

National class	FRA 2010 categories					
	Prod.	Prot.	Cons. Biodiv.	Soc. Serv.	Multiple	No unknown Other land
Production <sup>1</sup>	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, 2005 and 2010.

National class	FRA 2010 categories					
	Prod.	Prot.	Cons. Biodiv.	Soc. Serv.	Multiple	No unknown
Production <sup>1</sup>	75%		10%		15%	
Future production	75%		10%		15%	
Reserve forest						100%
Protection Forest			100%			
Afforestation & Salv. Pot.						100%
Other areas						100%

<sup>1</sup> 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 break up percentage. 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, plantation areas have been reclassified as production forests and added to this category.

Plantation	Estimated plantation (ha)			
	1990	2000	2005	2010
Rubber wood	15 800	19 800	21 800	23 800

Plantations	47 000	62 600	70 500	63 200
<b>Total</b>	<b>62 800</b>	<b>82 400</b>	<b>92 300</b>	<b>86 100</b>

### 3.4 Data for Table T3

**Table 3a – Primary designated function**

FRA 2010 Categories	Forest area (1 000 hectares)			
	1990	2000	2005	2010
Production	3 994	7 474	7 311	7 132
Protection of soil and water	0	0	0	0
Conservation of biodiversity	409	1 376	1 344	1 312
Social services	0	0	0	0
Multiple use	694	1 478	1 444	1 409
Other (please specify in comments below the table)	0	0	0	0
No / unknown	26 426	19 803	19 338	18 874
<b>TOTAL</b>	<b>31 523</b>	<b>30 132</b>	<b>29 437</b>	<b>28 726</b>

**Table 3b – Special designation and management categories**

FRA 2010 Categories	Forest area (1 000 hectares)			
	1990	2000	2005	2010
Area of permanent forest estate <sup>1</sup>	47.0	62.6	70.5	63.2
Forest area within protected areas <sup>2</sup>	313.32	313.32	313.32	313.32
Forest area under sustainable forest management	6 588.68	6 373.17	4 769.54	4 156.133
Forest area with management plan <sup>3</sup>	n.a	n.a	n.a	n.a

**Notes:**

- 1 Due to the land tenure system in PNG where 97 % of the land is owned by customary landowners under customary law, there is minimal Permanent Forest Estate or none of any significance. The figures above are mainly from state land under plantations.
- 2 These data are based on the FIMS report which was last updated in 1996.
- 3 There are no accurate data available for this category (Forest area with management plan), however, these areas are intended to be the same (or slightly less) as those under the category – Forest area under sustainable forest management as it is these areas that a management plan is required for timber production purposes.

3.5 Comments to Table T3

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Production	Production forests is all the areas under timber concessions or licences and excludes those that are in the planned stage or proposed for production	There had been an increase as new timber areas are acquired and committed for timber production
Protection of soil and water	There is no specific data available on this function	
Conservation of biodiversity	Only the legally recognised areas have been included in this table	There is a decrease in the area from 2000 due to conversion of conservation areas into other land use due to the wishes of the land owners. Much of this is now under timber concessions
Social services	No data available for this	
Multiple use	Based on the 15 % assumed from production forest as being used for multiple use purpose	
Other		
No / unknown designation	This includes areas that are termed “reserved forest” as their designation is yet unknown. Includes all the potential forest development areas identified in the Provincial Forest Plans and which have yet to be acquired by the State.	
Area of permanent forest estate	These are mainly plantations on state land	The expected trend is that the areas under plantations (PFE) will increase due to interest as well in carbon trade.
Forest area within protected areas		
Forest area under sustainable forest management	Since 1994 all timber concessions are acquired under the concept of Forest Management Agreements where SFM is the main criteria	There is a decrease in the areas due to a number of Timber Rights Purchase (TRP) areas expiring in 2009.
Forest area with management plan	All timber concessions (allocated timber area) required a 5 year management plan with an annual review during the currency of the concession period.	No new timber projects are anticipated to be allocated in the year 2010.

**Other general comments to the table**

The data for Table 3b were generated from the internal PNG Forest Authority Timber Permits, Local Forest Areas and Timber Licences Status from various years and the FIMS 1996 Report.

## 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 <u>outside</u> 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).
<b>Characteristics categories</b>	
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.
<b>Special categories</b>	
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
FIM Reports	H		1996	
<b>FIM Reports</b>	H		2008	Updated in FIM database
UPNG “State of Forests of PNG” report	H	Mangroves	2008	Based on remote sensing 1972-2002

#### 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.

### 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.

From T1

Plantation	Estimated area of plantations (ha)			
	1990	2000	2005	2010
Rubber wood	15 800	19 800	21 800	23 800
Plantations	47 000	62 600	70 500	63 200
<b>Total</b>	<b>62 800</b>	<b>82 400</b>	<b>92 300</b>	<b>86 100</b>

	Area of mangroves (1000 ha)					
	1975	1990	1996	2000	2005	2010
Mangrove	606.1	564.7	550.0	540.2	527.9	515.6

## 4.3 Analysis and processing of national data

### 4.3.1 Estimation and forecasting

Forest area in T1 used.

The simple linear extrapolation was used to estimate mangrove for 2010 using T1 data.

### 4.3.2 Reclassification into FRA 2010 categories

All areas not subject to logging or other human intervention have been reclassified as primary forest.

## 4.4 Data for Table T4

Table 4a

FRA 2010 Categories	Forest area (1000 hectares)			
	1990	2000	2005	2010
Primary forest	31 329.2	29 533.6	28 343.7	26 209.9
Other naturally regenerated forest	131	517	1 001	2 430
...of which of introduced species	n.a	n.a	n.a	n.a
Planted forest	62.8	82.4	92.3	86.1
...of which of introduced species	n.a	n.a	n.a	n.a
<b>TOTAL</b>	<b>31 523</b>	<b>30 133</b>	<b>29 437</b>	<b>28 726</b>

Table 4b

FRA 2010 Categories	Area (1000 hectares)			
	1990	2000	2005	2010
Rubber plantations (Forest)	15.8	19.8	21.8	23.8
Mangroves (Forest and OWL)	564.7	540.2	527.9	515.6
Bamboo (Forest and OWL)	n.a	n.a	n.a	n.a



4.5 **Comments to Table T4**

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Primary forest	This includes all the forest that are either currently under timber permits and operational and those other areas that have been identified as potential timber areas and also those in the “reserve forest” areas where their status is yet to be determined.	There is a substantial decrease in the area of primary forest due to more areas being brought into production through the allocation of new timber permits.
Other naturally regenerating forest	Includes mostly timber concessions that have expired and reverting back to their owners and that are regenerating post logging	There is an increase in the area due to expiring timber concessions. No trend can be determined nor should be done.
Planted forest		
Rubber plantations		
Mangroves	Based on the University of Papua New Guinea report there is 574 867 ha (calibrated) of mangrove forest identified by remote sensing in 2002.	
Bamboo		

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
Internal PNGFA Reports	M	Natural regeneration of logged over forest areas		

#### 5.2.2 Original data

Year	Hectares											
	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Natural regeneration of logged over forest areas <sup>1</sup>	2 041.9	4 842.2	3 915.7	1 466.4	2 902.6	4 405.8	3 916.1	4 207.1	6 694.3	5 577.8	3 718.0	2 947.2
Average				3 506.54				4 822.66				

Notes:

These are areas that have been logged and over which the PNG Forest Authority has applied some form of management by restocking/reseeding (reforestation) under a programme called ‘reforestation naturally’.

Source: Internal PNGFA Report

### 5.3 Analysis and processing of national data

#### 5.3.1 Calibration

#### 5.3.2 Estimation and forecasting

### 5.3.3 Reclassification into FRA 2010 categories

[No actual figures available to complete Table T5]

### 5.4 Data for Table T5

FRA 2010 Categories	Annual forest establishment (hectares/year)			...of which of introduced species <sup>1)</sup> (hectares/year)		
	1990	2000	2005	1990	2000	2005
Afforestation						
Reforestation						
...of which on areas previously planted						
Natural expansion of forest						

1 There are a number of introduced species as part of the reforestation program; mainly *Pinus caribaea*, *P. patula* and *Eucalyptus robusta* and *E. grandis*, however, data very poor to give actual figures for forecasting purposes.

### 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	Data presented is derived from PNGFA Forest Development Directorate	

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
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	

#### 6.2.2 Classification and definitions

National class	Definition
Gross volume	Includes all trees measuring 50 cm+ at diameter breast height in all forest area.

#### 6.2.3 Original data

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

For plantations, a growing stock of 150 m<sup>3</sup>/ha (expert estimate) is used.

### 6.3 Analysis and processing of national data

#### 6.3.1 Estimation and forecasting

Growing stock of natural forest (dbh 50+ cm) and plantations.

Years	Million cubic meters (over bark)					
	1975	1996	1990	2000	2005	2010
Natural Forests <sup>1)</sup>	1 181.7	1 069.5	1 101.6	1 048.1	1 021.4	994.7
Plantations <sup>2)</sup>			9.4	12.4	13.8	12.9
<b>Total Growing stock</b>			<b>1 111</b>	<b>1 060.5</b>	<b>1 035.2</b>	<b>1 007.6</b>

<sup>1)</sup> Estimated/forecasted with linear interpolation and extrapolation.

<sup>2)</sup> Calculated by multiplying 150 m<sup>3</sup>/ha with plantation area from table T3 (see section 3.3.3).

Growing stock of natural forest (dbh 20-49 cm) calculated by multiplying 60 m<sup>3</sup>/ha with natural forest area from table T1 (section 1.3.3).

	Volume (million cubic meters over bark)			
	1990	2000	2005	2010
Natural forest (DBH 20-49)	1 887.6	1 803.0	1 760.7	1 718.4

### 6.3.2 Reclassification into FRA 2010 categories

Total growing stock = Natural forest + plantations.

### 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	2 998.6	2 863.5	2 795.9	2 726.0	67	68	69	70
... of which coniferous	0	0	0	0	n.a	n.a	n.a	n.a
... of which broadleaved	2 998.6	2 863.5	2 795.9	2 726.0	67	68	69	70
Growing stock of commercial species	n.a	n.a	n.a	n.a	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
1 <sup>st</sup>	<i>n.a</i>	<i>n.a</i>	n.a	n.a	n.a
2 <sup>nd</sup>	<i>n.a</i>	<i>n.a</i>	n.a	n.a	n.a
3 <sup>rd</sup>	<i>n.a</i>	<i>n.a</i>	n.a	n.a	n.a
4 <sup>th</sup>	<i>n.a</i>	<i>n.a</i>	n.a	n.a	n.a
5 <sup>th</sup>	<i>n.a</i>	<i>n.a</i>	n.a	n.a	n.a
6 <sup>th</sup>	<i>n.a</i>	<i>n.a</i>	n.a	n.a	n.a
7 <sup>th</sup>	<i>n.a</i>	<i>n.a</i>	n.a	n.a	n.a
8 <sup>th</sup>	<i>n.a</i>	<i>n.a</i>	n.a	n.a	n.a
9 <sup>th</sup>	<i>n.a</i>	<i>n.a</i>	n.a	n.a	n.a
10 <sup>th</sup>	<i>n.a</i>	<i>n.a</i>	n.a	n.a	n.a
Remaining			n.a	n.a	n.a
<b>TOTAL</b>			<b>n.a</b>	<b>n.a</b>	<b>n.a</b>

Note: Rank refers to the order of importance in terms of growing stock, i.e. 1<sup>st</sup> 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.

Since there was no available data on the growing stock, the listed species below are some of those that are frequently being harvested and exported out of the country.

Scientific Name	Common Name
<i>Pometia spp.</i>	Taun
<i>Homalium foetidum</i>	Malas
<i>Calophyllum spp.</i>	Calophyllum
<i>Eucalyptus degluta*</i>	Kamarere

<i>Terminalia spp.</i>	Terminalia
<i>Palaquim warburgianum</i>	Pencil Cedar
<i>Dillenia papuana</i>	Dillenia
<i>Anisoptera thurifera</i>	Mersawa
<i>Canarium spp.</i>	Red Canarium
<i>Burckella spp.</i>	Burckella

\* Harvested and exported from plantation

**Table 6c – Specification of threshold values**

Item	Value	Complementary information
Minimum diameter (cm) at breast height <sup>1</sup> of trees included in growing stock (X)	20 cm	
Minimum diameter (cm) at the top end of stem for calculation of growing stock (Y)		Up to first branch
Minimum diameter (cm) of branches included in growing stock (W)	Not included	
Volume refers to “above ground” (AG) or “above stump” (AS)	AS	

### 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	<p>The growing stock has been reported only for broad leaved forests as there is no data for coniferous forests that constitute only a very small percent of total forest area.</p> <p>The small area of coniferous forest are found in the montane forests in a limited number of provinces and comprise mostly <i>Araucaria spp.</i>, mostly <i>A. cunninghamii</i> and <i>A. hunsteinii</i></p>	
Growing stock of commercial species	There is no specific data to differentiate this from the total growing stock.	
Growing stock composition		

Other general comments to the table

<sup>1</sup> 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.

## 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
2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 4.	M	BCEF	all	No comments

#### 7.2.2 Original data

Volume growing stock from T6.

### 7.3 Analysis and processing of national data

For forests, the Above-ground biomass is calculated using a BCEF of 1.5 based on a climatic zone of humid tropics and natural forest with a stocking of between 80-120m<sup>3</sup>/ha. For other wooded land, the Above-ground biomass is based on the same eco-region and a stocking of 11-20m<sup>3</sup>/ha (BCEF 4.0). The Below-ground biomass was derived by applying a root-shoot ratio of 0.20.

### 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	4 497.9	4 295.2	4 193.9	4 089.0	268.0	272.0	276.0	280.0
Below-ground biomass	899.6	859.0	838.8	817.8	53.6	54.4	55.2	56.0
Dead wood	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
<b>TOTAL</b>	<b>n.a.</b>	<b>n.a.</b>	<b>n.a.</b>	<b>n.a.</b>	<b>n.a.</b>	<b>n.a.</b>	<b>n.a.</b>	<b>n.a.</b>

## 7.5 Comments to Table T7

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Above-ground biomass	The PNG forest density ranges from 8-50m <sup>3</sup> /ha and may on average contained in the BCEF 4.	It is hard to provide factual trends due to limited data, but the use of IPCC default values of BCEF 4 is our best estimates.
Below-ground biomass	Limited data has been generated, but unavailable at this stage.	As above
Dead wood	No work has been done on this aspect of biomass. Where does litter comes into the picture?	As above

Other general comments to the table
<p>Obviously PNG does not have the data for such information. If it has then these may not be readily available. The limited data that we have cannot be projected to represent all forest types in the country. The increasing trend for biomass increase and a decline in below ground biomass is difficult to understand as one would think that the increases in the biomass would inevitably show a similar trend in the below ground biomass. More work has to be conducted on this matter.</p>



## 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 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 4.	M	Carbon	all	No comments

#### 8.2.2 Original data

Biomass data from T7.

### 8.3 Analysis and processing of national data

The IPCC carbon fraction default value of 0.47 is used for all calculations.

## 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	2 114.0	2 018.8	1 971.1	1 921.8	126.0	127.8	129.7	131.6
Carbon in below-ground biomass	422.8	403.8	394.2	384.4	25.2	25.6	25.9	26.3
<b>Sub-total: Living biomass</b>	<b>2 536.8</b>	<b>2 422.5</b>	<b>2 365.4</b>	<b>2 306.2</b>	<b>151.2</b>	<b>153.4</b>	<b>155.7</b>	<b>157.9</b>
Carbon in dead wood	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a
Carbon in litter	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a
<b>Sub-total: Dead wood and litter</b>	<b>n.a</b>	<b>n.a</b>	<b>n.a</b>	<b>n.a</b>	<b>n.a</b>	<b>n.a</b>	<b>n.a</b>	<b>n.a</b>
Soil carbon	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a
<b>TOTAL</b>	<b>n.a</b>	<b>n.a</b>	<b>n.a</b>	<b>n.a</b>	<b>n.a</b>	<b>n.a</b>	<b>n.a</b>	<b>n.a</b>

Soil depth (cm) used for soil carbon estimates	
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## 8.5 Comments to Table T8

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Carbon in above-ground biomass	Again, as with biomass our forest carbon contents have yet to be established, although we have some limited data, but these cannot be applied to all forest types	No comments due to lack of data and the extent of data coverage for all forest types in the country
Carbon in below-ground biomass	Same as above	Same as above
Carbon in dead wood	Same as above	Same as above
Carbon in litter	Same as above	Same as above
Soil carbon	Same as above	Same as above

Other general comments to the table
The general trend of carbon is closely related to the biomass trends and thus the same comments can be made. For PNG the current limited data on above ground biomass carbon indicated lower values, but these have to be reassessed. More detailed and extensive work has to be carried out on these matters.

## 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/or uncontrolled vegetation fire.
Planned fire	A vegetation fire regardless of ignition source that burns according to management objectives and requires limited or no suppression action.

### 9.2 National data

#### 9.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
University of PNG report “State of forests of PNG”	H	Area	2002	Report cites total area burned from 1972 – 2002 as being 347,079ha

#### 9.2.2 Original data

As cited from the State of forest of Papua New Guinea, a report by the University of PNG remote sensing centre, reference is given to only the total area burned from 1972 to 2002. A figure of 347079 hectares is being cited though no reference is made to the number of fires nor the kind of areas that was burned. In general terms both montane forest areas and anthropogenic grasslands were burned.

### 9.3 Analysis and processing of national data

#### 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	208	n.a	219	n.a	230	n.a
... of which on forest	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
... of which on other wooded land	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
... of which on other land	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

**Table 9b**

FRA 2010 category	Proportion of forest area affected by fire (%)		
	1990	2000	2005
Wildfire	100	100	100
Planned fire	0	0	0

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

**9.5 Comments to Table T9**

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Area affected by fire		
Number of fires		
Wildfire / planned fire		

Other general comments to the table

## **10 Table T10 – Other disturbances affecting forest health and vitality**

Data is not available for this reporting table.n

## 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 Original data

Reported data is based on wood removals as reported by logging companies upon which timber royalties are calculated.

### 11.3 Data for Table T11

[Because of the 2005 figures were estimates, there should be some degree of variation since then]

FRA 2010 Category	Industrial roundwood removals			Woodfuel removals		
	1990	2000	2005	1990	2000	2005
Total volume (1000 m <sup>3</sup> o.b.)	1 785	2 136	2 832	n.a	n.a	n.a
... of which from forest	1 785	2 136	2 832	n.a	n.a	n.a
Unit value (local currency / m <sup>3</sup> o.b.)	2.12	10	10	n.a	n.a	n.a
Total value (1000 local currency)	3 800	20 238	27 465	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	Kina	Kina	Kina

### 11.4 Comments to Table T11

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Total volume of industrial roundwood removals	The data is based on wood removals as reported by logging companies upon which timber royalties are calculated	Up to 1990 there were fewer areas being developed as timber concessions. There has been a big increase in the number of timber concessions being developed and thus an increase in the volume being reported.

Total volume of woodfuel removals		
Unit value	Basic royalty rate from early 1970 up to 1989 was very low at an average of K2.12 /m3. This was later reviewed and increased to K10.00/m3 but for premium species the rate can go as high as K35/m3 and species dependent.	
Total value	The total value depends on the tree species and hence is not the same when multiplying total volume by unit value as per the values given in the tables above	

<b>Other general comments to the table</b>

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

Data is not available for this reporting table.



## 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 <u>wage or salary</u> in cash or in kind.
Self-employment	Persons who during a specified reference period performed some work for <u>profit or family gain</u> 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
PNG Forest Industries Association	M		1990-2008	
PNG Forest Authority Internal Reports	H		1990-2008	

#### 13.2.2 Original data

Category	1990	2000
Primary production of goods	8 280	7 820

### 13.3 Analysis and processing of national data

#### 13.4 Data for Table T13

FRA 2010 Category	Employment (1000 years FTE)			
	1990	2000	2005	2010
Employment in primary production of goods	n.a.	n.a.	n.a.	n.a.
...of which paid employment	8.28	7.82	7.50	7.30
...of which self-employment	n.a.	n.a.	n.a.	n.a.
Employment in management of protected areas	n.a.	n.a.	n.a.	n.a.

#### 13.5 Comments to Table T13

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
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Employment in primary production of goods		Due to current global economic melt down, the timber industry in particular is not seen to increase its activities, hence no marked increased in employment within the sector.
Paid employment / self-employment		
Employment in management of protected areas		

<b>Other general comments to the table</b>

## 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)			
<b>Forest policy statement with national scope</b>	<input checked="" type="checkbox"/>	Yes	
	<input type="checkbox"/>	No	
If Yes above, provide:	Year of endorsement	1991	
	Reference to document	National Forest Policy	
<b>National forest programme (nfp)</b>	<input type="checkbox"/>	Yes	
	<input checked="" type="checkbox"/>	No	
If Yes above, provide:	Name of nfp in country		
	Starting year		
	Current status	<input type="checkbox"/>	In formulation
		<input type="checkbox"/>	In implementation
		<input type="checkbox"/>	Under revision
<input type="checkbox"/>		Process temporarily suspended	
Reference to document or web site			
<b>Law (Act or Code) on forest with national scope</b>	<input checked="" type="checkbox"/>	Yes, specific forest law exists	
	<input type="checkbox"/>	Yes, but rules on forests are incorporated in other (broader) legislation	
	<input type="checkbox"/>	No, forest issues are not regulated by national legislation	
If Yes above, provide:	Year of enactment	1991	
	Year of latest amendment	2007	
	Reference to document	Forestry Act 1991 As amended	

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.	
<b>Sub-national forest policy statements</b>	<input type="checkbox"/> Yes
	<input checked="" type="checkbox"/> No
If Yes above, indicate the number of regions/states/provinces with forest policy statements	
<b>Sub-national Laws (Acts or Codes) on forest</b>	<input type="checkbox"/> Yes
	<input checked="" type="checkbox"/> No
If Yes above, indicate the number of regions/states/provinces with Laws on forests	

### 14.3 Comments to Table T14

Variable / category	Comments related to data, definitions, etc.
Forest policy statement with national scope	The PNG National Forest Policy was endorsed by Parliament in 1991
National forest programme (nfp)	No NFP in PNG
Law (Act or Code) on forest with national scope	The Forestry Act was enacted by Parliament in 1991 and is called the Forestry Act 1991. A number of amendments have been made with the latest being in 2007.
Sub-national forest policy statements	PNG has 19 provinces and none have in place and policy specific to forestry.
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 – Institutions

FRA 2010 Category	2008
Minister responsible for forest policy formulation : please provide full title	Minister for Forests
Level of subordination of Head of Forestry within the Ministry	1 <sup>st</sup> level subordination to Minister
	X 2 <sup>nd</sup> level subordination to Minister
	3 <sup>rd</sup> level subordination to Minister
	4 <sup>th</sup> or lower level subordination to Minister
Other public forest agencies at national level	None
Institution(s) responsible for forest law enforcement	PNG Forest Authority

Table 15b – Human resources

FRA 2010 Category	Human resources within public forest institutions					
	2000		2005		2008	
	Number	%Female	Number	%Female	Number	%Female
Total staff <sup>1,2</sup>	n.a.	n.a.	n.a.	n.a.	337	25
...of which with university degree or equivalent	n.a.	n.a.	n.a.	n.a.	252	16

Notes:

1. Includes human resources within public forest institutions at sub-national level
2. Excludes people employed in State-owned enterprises, education and research, as well as temporary / seasonal workers.

### 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	There is a separate Minister responsible for Forests in PNG who is the Minister for Forests.	
Level of subordination of Head of Forestry within the Ministry	The Head of Forestry is called the Managing Director who reports to the National Forest Board that then reports to the Minister.	
Other public forest agencies at national level	There is none	
Institution(s) responsible for forest law enforcement	The PNG Forest Authority is the only institution responsible for forest law enforcement in the country	
Human resources within public forest institutions		

Other general comments to the table

## 16 Table T16 – Education and research

### 16.1 FRA 2010 Categories and definitions

Term	Definition
Forest-related education	Post-secondary education programme with focus on forests and related subjects.
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 primarily implementing research programmes on forest matters. Funding is mainly 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
PNG University of Technology – Department of Forestry Records	M			

### 16.3 Data for Table T16

FRA 2010 Category	Graduation <sup>1)</sup> of students in forest-related education					
	2000		2005		2008	
	Number	%Female	Number	%Female	Number	%Female
Master's degree (MSc) or equivalent	n.a.	n.a.	n.a.	n.a.	1	0
Bachelor's degree (BSc) or equivalent	n.a.	n.a.	20	30	36	29
Forest technician certificate / diploma	n.a.	n.a.	15	67	13	54
FRA 2010 Category	Professionals working in publicly funded forest research centres <sup>2)</sup>					
	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.	2	0
Bachelor's degree (BSc) or equivalent	n.a.	n.a.	n.a.	n.a.	50	4

Notes:

1. Graduation refers to the number of students that have successfully completed a Bachelor's or higher degree or achieved a certificate or diploma as forest technician.
2. Covers degrees in all sciences, not only forestry.

#### 16.4 Comments to Table T16

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Graduation of students in forest-related education	Data provided by the PNG University of Technology	
Professionals working in public forest research centres	Data provided by the PNG Forest Authority – Human Resources Section	

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
PNGFA internal reports and documents	H	Budget allocations	1999 - 2008	

#### 17.2.2 Classification and definitions

National class	Definition
Recurrent Budget	Money allocated annually by the Ministry of Treasury to the Organisation
PIP Budget	This is a supplementary development budget aimed at projects
Donor Funds	Funds allocated for specific projects by donors

### 17.2.3 Original data

Recurrent Budget Allocations and Revenue in million Kina

Year	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Budget	17.000	20.946	17.000	22.501	19.125	20.501	23.427	23.968	24.450	27.450
Revenue	103.602	135.853	95.770	112.692	111.247	104.208	129.997	168.370	155.515	121.000

Note:

It is estimated that budget estimates for 2010 will increase; however, revenue will drop as number of timber industry will not increase. Furthermore, the current discussions on ‘climate change’ will have a big effect on the timber industry.

### 17.3 Analysis and processing of national data

#### 17.4 Data for Table T17

**Table 17a - Forest revenues**

FRA 2010 Categories	Revenues (1000 local currency)	
	2000	2005
Forest revenue	135 853	129 997

**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	20 946	23 427	n.a	n.a	20 946	23 427
Transfer payments	n.a	n.a	n.a	n.a	n.a	n.a
<b>Total public expenditure</b>	20 946	23 427	n.a	n.a	20 946	23 427
If transfer payments are made for forest management and conservation, indicate for what specific objective(s) - Please tick all that apply.	<input type="checkbox"/>	Reforestation				
	<input type="checkbox"/>	Afforestation				
	<input type="checkbox"/>	Forest inventory and/or planning				
	<input type="checkbox"/>	Conservation of forest biodiversity				
	<input type="checkbox"/>	Protection of soil and water				
	<input type="checkbox"/>	Forest stand improvement				
	<input type="checkbox"/>	Establishment or maintenance of protected areas				
	<input type="checkbox"/>	Other, specify below				

**17.5 Comments to Table T17**

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Forest revenue	This is revenue from export taxes collected from the export of logs.	There is no clear marked trend and there is fluctuation. By 2010 there is expected to be an upward trend due to 10 timber project coming into production.
Operational expenditure	The data is for the Government allocation to the PNG Forest Authority to operate. Other supplementary funds from 'projects' through donor funding mechanism is not accounted for here.	Since 1993 the allocations have declined from PGK38.00 million to its current level (2009) of PGK27.45 million. This is not expected to increase over the next 2years.
Transfer payments	No data immediately available though there are project funds under international cooperation especially in Forest Research.	Due to emerging interest in climate change and carbon trading there may be an increase in external funding particularly for Research.

Other general comments to the table