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

**GLOBAL FOREST RESOURCES  
ASSESSMENT**

**COUNTRY REPORTS**

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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](http://www.fao.org/forestry/fra2005)).

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The Global Forest Resources Assessment 2005 Country Report Series is designed to document and make available the information forming the basis for the FRA 2005 reports. The Country Reports have been compiled by officially nominated country correspondents in collaboration with FAO staff. Prior to finalisation, these reports were subject to validation by forestry authorities in the respective countries.

## **Report preparation and contact person**

No official report has been received from the country.

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

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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 <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
Wiser, S.K., L.E. Burrows, W.S. Sykes D.R. Drake & T.J. Savage 1999. A Natural Forest Inventory of Tongatapu and Nearby Islands. . Kingdom of Tonga NZODA 1998/99 Forestry Project	H		1998	

#### 1.2.2 Classification and definitions

The forest inventory of 1998 uses the following definitions:

National class	Definition
Interior tall forest	Interior forest is dominated by a wide range of native tree species, including <i>Grewia crenata</i> , <i>Rhus taitensis</i> , <i>Ellatostachys falcata</i> , <i>Cryptocarya hornei</i> , <i>Inocarpus fagifer</i> .
Coastal forest	This isis dominated by native tree species such as <i>Neisosperma ppositifolium</i> , <i>Myristica hypargyreae</i> , <i>Hernandia nymphaeifolia</i> and <i>Polyscias multijuga</i> .
Coastal Swamp Forest	This forest is usually dominated by <i>Excoecaria agallocha</i> and is periodically inundated with salt water.
Coconuts with secondary woody vegetation	The definition has been refined to include canopies of other plantation trees (such as mango). This type typically occurs where land has been abandoned from agriculture, either temporarily as bush fallow or permanently. It is distinguished from interior shrubland by the presence of an overstorey of planted trees; otherwise the character is similar. Stands may be regenerating into native forest and have quite developed stands of native trees and shrubs

	beneath coconuts or the understorey may be dominated by dense stands of <i>Leucaena leucocephala</i> or <i>Psidium guajava</i> .
Plantation of trees	This includes pines and other plantation woodlots as well as shelterbelts and stands of fruit trees such as mango.
Interior shrubland	Interior shrubland is dominated by native woody vegetation such as <i>Hibiscus tiliaceus</i> , <i>Psidium guajava</i> , <i>Leucaena leucocephala</i> . This maybe regenerating into interior forest following disturbance (fire, bush fallow stage).
Swamp/marsh	Swamp/marsh is dominated by herbaceous plants or shrubs.
Mangrove	Mangroves formation.
Coastal shrubland	Coastal shrubland is dominated by thickets of <i>Pandanus tectorius</i> , <i>Scaevola taccada</i> .
Non-vegetated	Outcrops, sands mudflats.
Actively farmed land	Cocunut plantations, non wood vegetation excluding marsh not usually cultivated.
Towns and villages	None

### 1.2.3 Original data

The forest inventory of 1998 gives the following data:

National class	Area (ha)
Interior tall forest	83
Coastal forest	331
Coastal Swamp Forest	483
Coconuts with secondary woody vegetation	1 836
Plantation of trees	22
Interior shrubland	420
Swamp/marsh	316
Mangrove	822
Coastal shrubland	196
Non-vegetated	175
Actively farmed land	19 586
Towns and villages	3 107
<b>TOTAL</b>	<b>27 377</b>

It should be noted that this inventory was only partial, covering about one third of the country.

## 1.3 Analysis and processing of national data

### 1.3.1 Calibration

No calibration was done. Total area and inland water area has been taken from FAOSTAT.

### 1.3.2 Estimation and forecasting

No information is available to make any trends. The data from the 1998 inventory have been used for all three reporting years, although it covered only about one third of the country. No information is available for the other islands and these are therefore assumed to be Other land.

#### 1.4 Reclassification into FRA 2005 classes

	Forest	Other Wooded land	Other land
Interior tall forest	100%		
Coastal forest	100%		
Coastal Swamp Forest	100%		
Coconuts with secondary woody vegetation	100%		
Plantation of trees	100%		
Interior shrubland		100%	
Swamp/marsh			100%
Mangrove	100%		
Coastal shrubland		100%	
Non-vegetated			100%
Actively farmed land			100%
Towns and villages			100%

#### 1.5 Data for National reporting table T1

FRA 2005 Categories	Area (1000 hectares)		
	1990	2000	2005
Forest	3.58	3.58	3.58
Other wooded land	0.62	0.62	0.62
Other land	67.81	67.81	67.81
...of which with tree cover <sup>1)</sup>			
Inland water bodies	3.00	3.00	3.00
<b>TOTAL</b>	<b>75.00</b>	<b>75.00</b>	<b>75.00</b>

#### 1.6 Comments to National reporting table T1

There is no complete inventory of forest resources in the Kingdom of Tonga. Inventory has only been done for the Tongatapu group of islands (reported in Wiser et al, 1999) which make up one-third of the total land area. However, this partial inventory is the best available information and has therefore been used directly for the reporting tables although it most probably is an underestimate.

## 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
FAO-RAS 1995. Tropical Forests Action Programme information mission to Pacific Island countries. TFAP Coordinating Unit, FAO, Rome		Ownership	1994	

#### 2.2.2 Original data

Land is owned by the crown but administered by nobles who allot it to the common people. The king and nobles retain 27% of the land for their own use, while the government owns another 18%.

### 2.3 Reclassification into FRA 2005 classes

All land is considered to be public-owned

### 2.4 Data for National reporting table T2

FRA 2005 Categories	Area (1000 hectares)			
	Forest		Other wooded land	
	1990	2000	1990	2000
Private ownership				
Public ownership	3.58	3.58		
Other ownership				
<b>TOTAL</b>	<b>3.58</b>	<b>3.58</b>	<b>NDA</b>	<b>NDA</b>



### 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
Wiser, S.K., L.E. Burrows, W.S. Sykes, D.R. Drake & T.J. Savage 1999. A Natural Forest Inventory of Tongatapu and Nearby Islands. . Kingdom of Tonga NZODA 1998/99 Forestry Project		Plantation area	1998	

##### 3.2.2 Classification and definitions

No definitions were available

### 3.2.3 Original data

Area covered by plantations in the Tongatapu group of Islands = 22 hectares

### 3.2.4 Estimation and forecasting

The values given in the original data were the same values used for all three reporting years.

### 3.3 Reclassification into FRA 2005 classes

Natural hardwood forests ---. 100% No or unknown function.

Plantations ----- 100% production

### 3.4 Data for National reporting table T3

FRA 2005 Categories / Designated function	Area (1000 hectares)					
	Primary function			Total area with function		
	1990	2000	2005	1990	2000	2005
<b>Forest</b>						
Production	0.022	0.022	0.022			
Protection of soil and water						
Conservation of biodiversity						
Social services						
Multiple purpose				not appl.	not appl.	not appl.
No or unknown function	3.56	3.56	3.56	not appl.	not appl.	not appl.
<b>Total - Forest</b>	<b>3.58</b>	<b>3.58</b>	<b>3.58</b>	<b>not appl.</b>	<b>not appl.</b>	<b>not appl.</b>
<b>Other wooded land</b>						
Production						
Protection of soil and water						
Conservation of biodiversity						
Social services						
Multiple purpose				not appl.	not appl.	not appl.
No or unknown function	0.62	0.62	0.62	not appl.	not appl.	not appl.
<b>Total – Other wooded land</b>	<b>0.62</b>	<b>0.62</b>	<b>0.62</b>	<b>not appl.</b>	<b>not appl.</b>	<b>not appl.</b>

### 3.5 Comments to National reporting table T3

According to FAO-RAS (1993)<sup>1</sup>, 579 hectares have been planted, mainly of *Pinus caribaea* on exposed and infertile sites and *Toona australis* on well-sheltered and more fertile sites. However, these figures have not been used in the table above.

<sup>1</sup> FAO-RAS 1993. Proceedings of Heads of Forestry meeting: 21-25 September 1992. South Pacific Forest Development Programme, FAO, Apia, Western Samoa.

## 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
Wiser, S.K. ,L.E. Burrows, W.S. Sykes D.R. Drake & T.J. Savage 1999. A Natural Forest Inventroy of Tongatapu and Nearby Islands. Kingdom of Tonga NZODA 1998/99 Forestry Project	H		1998	

#### 4.2.2 Classification and definitions

As for T1

### 4.2.3 Original data

1998

National class	Area (ha)
Interior tall forest	83
Coastal forest	331
Coastal Swamp Forest	483
Coconuts with secondary woody vegetation	1836
Plantation of trees	22
Interior shrubland	420
Mangrove	822
Coastal shrubland	196

## 4.3 Analysis and processing of national data

### 4.3.1 Calibration

No calibration was done

### 4.3.2 Estimation and forecasting

The values given in the original data were the same values used for all three reporting years.

## 4.4 Reclassification into FRA 2005 classes

	Primary	Modified natural	Semi-natural	Productive plantation	Protective plantation
Interior tall forest					
Coastal forest		100%			
Coastal Swamp Forest		100%			
Coconuts with secondary woody vegetation		100%			
Plantation of trees				100%	
Interior shrubland		100%			
Mangrove		100%			
Coastal shrubland		100%			

## 4.5 Data for National reporting table T4

FRA 2005 Categories	Area (1000 hectares)					
	Forest			Other wooded land		
	1990	2000	2005	1990	2000	2005
Primary						
Modified natural	3.56	3.56	3.56	0.62	0.62	0.62
Semi-natural						
Productive plantation	0.02	0.02	0.02			
Protective plantation						
<b>TOTAL</b>	<b>3.58</b>	<b>3.58</b>	<b>3.58</b>	<b>0.62</b>	<b>0.62</b>	<b>0.62</b>

#### 4.6 Comments to National reporting table T4

Considering the extremely limited size of natural forests and other wooded land, these were all assumed to be modified natural.

According to FAO-RAS (1993)<sup>2</sup>, 579 hectares have been planted, mainly of *Pinus caribaea* on exposed and infertile sites and *Toona australis* on well-sheltered and more fertile sites. However, these figures have not been used in the table above, which is based on the information from the inventory carried out in 1998.

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<sup>2</sup> **FAO-RAS** 1993. Proceedings of Heads of Forestry meeting: 21-25 September 1992. South Pacific Forest Development Programme, FAO, Apia, Western Samoa.

## **5 Table T5 – Growing stock**

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

## **6 Table T6 – Biomass stock**

No information has been found to support estimates of biomass stock.

## **7 Table T7 – Carbon stock**

No information has been found to support estimates of carbon stock.

## **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

### 9.1 FRA 2005 Categories and definitions

Category	Definition
Number of native tree species	The total number of native tree species that have been identified within the country.
Number of critically endangered tree species	The number of native tree species that are classified as “Critically endangered” in the IUCN red list.
Number of endangered tree species	The number of native tree species that are classified as “Endangered” in the IUCN red list.
Number of vulnerable tree species	The number of native tree species that are classified as “Vulnerable” in the IUCN red list.

### 9.2 National data

#### 9.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
IUCN REDLIST				

#### 9.2.2 Original data

Critically endangered species: *Aglaia heterotricha*

Vulnerable species: *Aglaia saltatorum* and *Cycas seemannii*

### 9.3 Data for National reporting table T9

FRA 2005 Categories	Number of species (year 2000)
Native tree species	
Critically endangered tree species	1
Endangered tree species	
Vulnerable tree species	2

## **10 Table T10 – Growing stock composition**

No information has been found to support estimates of 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
FAOSTAT				

#### 11.2.2 Original data

	volume - m3 under bark				
	1988	1989	1990	1991	1992
Production of Industrial Roundwood	4600	4600	4600	4600	4600
	1998	1999	2000	2001	2002
Production of Industrial Roundwood	3900	2100	2100	2100	2100

FAOSTAT gives values under bark. By multiplying these values by 1.15 we get an estimate over bark. The original data is after recalculation is given below.

	volume - m3 over bark				
	1988	1989	1990	1991	1992
Production of Industrial Roundwood	5290	5290	5290	5290	5290
	1998	1999	2000	2001	2002
Production of Industrial Roundwood	4485	2415	2415	2415	2415

### 11.3 Analysis and processing of national data

#### 11.3.1 Estimation and forecasting

The value reported for 1990 is the average the years 1988-1992 while the reported value for 2000 is the average of the years 1998-2002. The reported value for 2005 is the value reported in 2002.

#### 11.4 Reclassification into FRA 2005 classes

Production of industrial roundwood --→ Industrial wood removal

#### 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	5.290	2.829	2.415			
Woodfuel	NDA	NDA	NDA			
<b>TOTAL for Country</b>	<b>ID</b>	<b>ID</b>	<b>ID</b>			

**12 Table T12 – Value of wood removal**

No information has been found to support estimates of the value of the wood removal.

**13 Table T13 – Non-wood forest product removal**

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

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

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

**15 Table T15 – Employment in forestry**

No information has been found to support estimates of employment in forestry.