



**Forestry Department**

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

**GLOBAL FOREST RESOURCES  
ASSESSMENT 2010**

**COUNTRY REPORT**

**SINGAPORE**

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## The Forest Resources Assessment Programme

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

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

The reporting framework for FRA 2010 is based on the thematic elements of sustainable forest management acknowledged in intergovernmental forest-related fora and includes variables related to the extent, condition, uses and values of forest resources, as well as the policy, legal and institutional framework related to forests. More information on the FRA 2010 process and the results - including all the country reports - is available on the FRA Web site ([www.fao.org/forestry/fra](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
<b>Chan, L. and Corlett, R. T. 1997.</b> Biodiversity in the nature reserves of Singapore, Proceedings of the Nature Reserves Survey Seminar, Singapore December 1997. The Gardens’ Bulletin, Singapore 49 (2). National Parks Board, Singapore Botanic Gardens, Cluny Road.	H	Extent and National Definitions	1990	
<b>Corlett, R.T., 1997.</b> The vegetation in the Nature Reserves of Singapore. The Garden’ Bulletin, Singapore 49 (2) : pp : 147-160.	M	Extent	1997	Mentions that no change has taken place since 1990

### 1.2.2 Classification and definitions

National class	Definition
Dryland Primary Forest	It is simplest and most informative to refer this forest as primary forest, i.e., forest which has never been completely cleared.
Mangrove Forest	Tidal forest on the mud flats at the mouth of streams and along the shore of shallow bays. Marsh and tidal waste The stated figure for marsh and tidal waste is excluding the 500 ha stated to be mangrove.
Primary Freshwater Swamp Forest	This swamp system is extremely complex. Swamp forest occurs in low-lying areas where the water table is close to the soil surface.

Secondary Forests	Secondary re-growth filled up logged forest areas and gradually colonised land that was originally cleared and used for cultivation.
Other	Water bodies (gazetted reserves) and Shrubland etc. The figure is derived as a difference (The total land area- Dryland Primary Forest- Primary Freshwater Swamp Forest- Secondary Forests, Mangrove forests- Built up areas, Farm holding areas, Marsh and tidal wash, Others).
Built up areas	Not defined
Farm holding areas	Not defined
Marsh and tidal waste	Not defined
Others	Inland waters, public gardens, open spaces, cemeteries, non built up areas in military establishments and unused land.

(Source: Chan, L. and Corlett, R. T. 1997)

### 1.2.3 Original data

National class	Extent in ha in 1990
Dryland Primary Forest	192
Primary Freshwater Swamp Forest	87
Mangrove Forest	500
Secondary Forests	1560
Other	1,021
Built up areas	32220
Farm holding areas	1080
Marsh and tidal waste	1050
Others	27070
Total	64780

(Source: Chan, L. and Corlett, R. T. 1997)

## 1.3 Analysis and processing of national data

### 1.3.1 Calibration

The total area of the country in national statistics is 65 (000 ha) and it varies with UN STAT figure of 69 900 ha, therefore calibration was done by adjusting the area under “other land”.

National Categories	Extent of Forests in ha
	1990
Dryland Primary Forest	192
Primary Freshwater Swamp Forest	87
Mangrove Forest	500
Secondary Forests	1560
All Other land Categories	66561
... of which ... with tree cover	NIL
Inland water bodies	1000
<b>Total for country</b>	<b>69900</b>

### 1.3.2 Estimation and forecasting

Based on Corlett (1997) it has been assumed that there is no change in forest resources since 1990 and the same assumption has been applied for forecasting figures for 2008.

National Categories	Extent in ha			
	1990	2000	2005	2008
Dryland Primary Forest	192	192	192	192
Primary Freshwater Swamp Forest	87	87	87	87
Mangrove Forest	500	500	500	500
Secondary Forests	1560	1560	1560	1560
All Other land Categories	66561	66561	66561	66561
... of which ... with tree cover	NIL	NIL	NIL	NIL
Inland water bodies	1000	1000	1000	1000
<b>Total for country</b>	<b>69900</b>	<b>69900</b>	<b>69900</b>	<b>69900</b>

### 1.3.3 Reclassification into FRA 2010 categories

National Categories (Land)	FRA classes (%)	
	Forest	Other Land
Dryland Primary Forest	100	
Primary Freshwater Swamp Forest	100	
Mangrove Forest	100	
Secondary Forests	100	
All Other land Categories		100

### 1.4 Data for Table T1

FRA 2010 categories	Area (1000 hectares)			
	1990	2000	2005	2010
Forest	2.3	2.3	2.3	2.3
Other wooded land	0.0	0.0	0.0	0.0
Other land	66.6	66.6	66.6	66.6
...of which with tree cover	0	0	0	0
Inland water bodies	1.0	1.0	1.0	1.0
<b>TOTAL</b>	<b>69.9</b>	<b>69.9</b>	<b>69.9</b>	<b>69.9</b>

### 1.5 Comments to Table T1

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Forest		Based on Corlett (1997), it has been assumed that no changes have occurred since 1990 and that changes are likely to be small increases. The country is relatively rich in trees outside forests (FRA 2000 validation document).

Other wooded land		
Other land		
Other land with tree cover		
Inland water bodies		

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

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

## 2 Table T2 – Forest ownership and management rights

### 2.1 FRA 2010 Categories and definitions

Category	Definition
Public ownership	Forest owned by the State; or administrative units of the public administration; or by institutions or corporations owned by the public administration.
Private ownership	Forest owned by individuals, families, communities, private co-operatives, corporations and other business entities, private religious and educational institutions, pension or investment funds, NGOs, nature conservation associations and other private institutions.
Individuals (sub-category of Private ownership)	Forest owned by individuals and families.
Private business entities and institutions (sub-category of Private ownership)	Forest owned by private corporations, co-operatives, companies and other business entities, as well as private non-profit organizations such as NGOs, nature conservation associations, and private religious and educational institutions, etc.
Local communities (sub-category of Private ownership)	Forest owned by a group of individuals belonging to the same community residing within or in the vicinity of a forest area. The community members are co-owners that share exclusive rights and duties, and benefits contribute to the community development.
Indigenous / tribal communities (sub-category of Private ownership)	Forest owned by communities of indigenous or tribal people.
Other types of ownership	Other kind of ownership arrangements not covered by the categories above. Also includes areas where ownership is unclear or disputed.
<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 Original data

All forests are publicly owned

## 2.3 Data for Table T2

**Table 2a - Forest ownership**

FRA 2010 Categories	Forest area (1000 hectares)		
	1990	2000	2005
Public ownership	2.3	2.3	2.3
Private ownership	0	0	0
...of which owned by individuals	0	0	0
...of which owned by private business entities and institutions	0	0	0
...of which owned by local communities	0	0	0
...of which owned by indigenous / tribal communities	0	0	0
Other types of ownership	0	0	0
<b>TOTAL</b>	<b>2.3</b>	<b>2.3</b>	<b>2.3</b>

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

Does ownership of trees coincide with ownership of the land on which they are situated?	√	Yes
		No
If <b>No</b> above, please describe below how the two differ:		

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

FRA 2010 Categories	Forest area (1000 hectares)		
	1990	2000	2005
Public Administration	2.3	2.3	2.3
Individuals	0	0	0
Private corporations and institutions	0	0	0
Communities	0	0	0
Other	0	0	0
<b>TOTAL</b>	<b>2.3</b>	<b>2.3</b>	<b>2.3</b>

## 2.4 Comments to Table T2

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Public ownership		
Private ownership		
Other types of ownership		
Management rights		

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
				Expert assumptions

### 3.2.2 Original data

All forest area is managed mainly for conservation of biodiversity with recognition that they also serve the social function and conserve soil and water.

### 3.3 Data for Table T3

**Table 3a – Primary designated function**

FRA 2010 Categories	Forest area (1000 hectares)			
	1990	2000	2005	2010
Production	0	0	0	0
Protection of soil and water	0	0	0	0
Conservation of biodiversity	2.3	2.3	2.3	2.3
Social services	0	0	0	0
Multiple use	0	0	0	0
Other (please specify in comments below the table)	0	0	0	0
No / unknown	0	0	0	0
<b>TOTAL</b>	<b>2.3</b>	<b>2.3</b>	<b>2.3</b>	<b>2.3</b>

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

FRA 2010 Categories	Forest area (1000 hectares)			
	1990	2000	2005	2010
Area of permanent forest estate	n.a.	n.a.	n.a.	n.a.
Forest area within protected areas	n.a.	n.a.	n.a.	n.a.
Forest area under sustainable forest management	n.a.	n.a.	n.a.	n.a.
Forest area with management plan	n.a.	n.a.	n.a.	n.a.

### 3.4 Comments to Table T3

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Production		
Protection of soil and water		
Conservation of biodiversity		
Social services		
Multiple use		
Other		
No / unknown designation		
Area of permanent forest estate		
Forest area within protected areas		
Forest area under sustainable forest management		
Forest area with management plan		

Other general comments to the table
All forest area is managed mainly for conservation of biodiversity with recognition that they also serve the social function and conserve soil and water.

## 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
Corlett, R.T., 1997. The vegetation in the Nature Reserves of Singapore. The Gardens Bulletin of Singapore Vol. 49 (2) : pp : 147-160	M	Extent	1997	

#### 4.2.2 Classification and definitions

Detailed information is not available.

### 4.2.3 Original data

Corlett (1997) considers all the forest areas as primary nature.

## 4.3 Data for Table T4

**Table 4a**

FRA 2010 Categories	Forest area (1000 hectares)			
	1990	2000	2005	2010
Primary forest	2.3	2.3	2.3	2.3
Other naturally regenerated forest	0	0	0	0
...of which of introduced species	0	0	0	0
Planted forest	0	0	0	0
...of which of introduced species	0	0	0	0
<b>TOTAL</b>	<b>2.3</b>	<b>2.3</b>	<b>2.3</b>	<b>2.3</b>

**Table 4b**

FRA 2010 Categories	Area (1000 hectares)			
	1990	2000	2005	2010
Rubber plantations (Forest)	0	0	0	0
Mangroves (Forest and OWL)	0.5	0.5	0.5	0.5
Bamboo (Forest and OWL)	0	0	0	0

#### 4.4 Comments to Table T4

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Primary forest		
Other naturally regenerating forest		
Planted forest		
Rubber plantations		
Mangroves	Mangrove forests is subsumed under FRA 2010 category of Forest in Table T1	
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 Original data

There are no further establishment and expansion of forests.

### 5.3 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	0	0	0	0	0	0
Reforestation	0	0	0	0	0	0
...of which on areas previously planted						
Natural expansion of forest	0	0	0	0	0	0

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

### 5.4 Comments to Table T5

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

Other general comments to the table

**6 Table T6 – Growing stock**

No data is available

**7 Table T7 – Biomass stock**

No data is available

**8 Table T8 – Carbon stock**

No data is available

## 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 Original data

There are no reports on damage to forests by fire.

### 9.3 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						
... of which on forest	0	0	0	0	0	0
... of which on other wooded land						
... of which on other land						

Table 9b

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

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

#### 9.4 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
<p>There are no reports on damage to forests by fire.</p>

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

### 10.1 FRA 2010 Categories and definitions

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

#### 10.1.1 Original data

There are no reports on damage to forests by insects, diseases, other biotic factors or abiotic factors.

### 10.2 Data for Table T10

**Table 10a – Disturbances**

FRA 2010 category	Affected forest area (1000 hectares)		
	1990	2000	2005
Disturbance by insects	0	0	0
Disturbance by diseases	0	0	0
Disturbance by other biotic agents	0	0	0
Disturbance caused by abiotic factors	0	0	0
<b>Total area affected by disturbances</b>	<b>0</b>	<b>0</b>	<b>0</b>

Notes: 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.

The total area affected by disturbances is not necessarily the sum of the individual disturbances as these may be overlapping.



Disturbance caused by abiotic factors		
Major outbreaks		
Invasive species		

**Other general comments to the table**

There are no reports on damage to forests by insects, diseases, other biotic factors or abiotic factors.

## 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

Singapore's policy is not to exploit timber and non-timber products from forest areas.

### 11.3 Data for Table T11

FRA 2010 Category	Industrial roundwood removals			Woodfuel removals		
	1990	2000	2005	1990	2000	2005
Total volume (1000 m <sup>3</sup> o.b.)	0	0	0	0	0	0
... of which from forest						
Unit value (local currency / m <sup>3</sup> o.b.)	0	0	0	0	0	0
Total value (1000 local currency)	0	0	0	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.

	1990	2000	2005
Name of local currency			

### 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		
Total volume of woodfuel removals		
Unit value		
Total value		

Other general comments to the table

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

### 12.1 FRA 2010 Categories and definitions

Term	Definition
Non-wood forest product (NWFP)	Goods derived from forests that are tangible and physical objects of biological origin other than wood.
Value of NWFP removals	For the purpose of this table, value is defined as the market value at the site of collection or forest border.

### NWFP categories

Category
<b><u>Plant products / raw material</u></b>
1. Food
2. Fodder
3. Raw material for medicine and aromatic products
4. Raw material for colorants and dyes
5. Raw material for utensils, handicrafts & construction
6. Ornamental plants
7. Exudates
8. Other plant products
<b><u>Animal products / raw material</u></b>
9. Living animals
10. Hides, skins and trophies
11. Wild honey and bee-wax
12. Wild meat
13. Raw material for medicine
14. Raw material for colorants
15. Other edible animal products
16. Other non-edible animal products

### 12.2 National data

#### 12.2.1 Original data

Singapore's policy is not to exploit timber and non-timber products from forest areas, therefore there is no data for this table.

**12.3 Data for Table T12**

Rank	Name of product	Key species	Unit	NWFP removals 2005		NWFP category
				Quantity	Value (1000 local currency)	
1 <sup>st</sup>						
2 <sup>nd</sup>						
3 <sup>rd</sup>						
4 <sup>th</sup>						
5 <sup>th</sup>						
6 <sup>th</sup>						
7 <sup>th</sup>						
8 <sup>th</sup>						
9 <sup>th</sup>						
10 <sup>th</sup>						
All other plant products						
All other animal products						
<b>TOTAL</b>					<b>0</b>	

	2005
Name of local currency	

**12.4 Comments to Table T12**

Variable / category	Comments related to data, definitions, etc.
10 most important products	
Other plant products	
Other animal products	
Value by product	
Total value	

Other general comments to the 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
No published information is available				

#### 13.2.2 Classification and definitions

National class	Definition
Provision of services through Conservation Division	The total staff strength of Conservation Division of the National Parks Board.
Provision of services through Parks and Reserves	Number of staff within those sections of Conservation Division who are based directly in parks and reserves.

#### 13.2.3 Original data

Category	Employment (1000 person-years)		
	1990	2000	2005
Primary production of goods	NIL	NIL	NIL
Provision of services through Conservation Division	0.09	0.09	0.09
Unspecified forestry activities	NIL	NIL	NIL
<b>Total</b>	<b>0.09</b>	<b>0.09</b>	<b>0.09</b>

(Note 1. Total number of staff (90) in the Conservation Division, National Parks Board subsumes the number of staff (37), who are based directly in the parks and reserves.)

### 13.3 Analysis and processing of national data

#### 13.3.1 Calibration

All staff in the Conservation Division is under full-time employment.

#### 13.3.2 Estimation and forecasting

Same figures have been assumed for 1990, 2000 and 2005.

#### 13.3.3 Reclassification into FRA 2010 categories

Staff of the Conservation Division is employed for the provision of services including managing parks and reserves in protected areas and public education.

### 13.4 Data for Table T13

FRA 2010 Category	Employment (1000 years FTE)		
	1990	2000	2005
Employment in primary production of goods	0	0	0
...of which paid employment			
...of which self-employment			
Employment in management of protected areas	0.09	0.09	0.09

### 13.5 Comments to Table T13

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Employment in primary production of goods		
Paid employment / self-employment		
Employment in management of protected areas	Staff of the Conservation Division is employed for the provision of services including managing parks and reserves in protected areas and public education.	

Other general comments to the table

## 14 Table T14 – Policy and legal framework

### 14.1 FRA 2010 Categories and definitions

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

### 14.2 Data for Table T14

Indicate the existence of the following (2008)			
<b>Forest policy statement with national scope</b>		Yes	
	√	No	
If Yes above, provide:	Year of endorsement		
	Reference to document		
<b>National forest programme (nfp)</b>		Yes	
	√	No	
If Yes above, provide:	Name of nfp in country		
	Starting year		
	Current status		In formulation
			In implementation
			Under revision
		Process temporarily suspended	
Reference to document or web site			
<b>Law (Act or Code) on forest with national scope</b>		Yes, specific forest law exists	
	√	Yes, but rules on forests are incorporated in other (broader) legislation	
		No, forest issues are not regulated by national legislation	
If Yes above, provide:	Year of enactment	2005	
	Year of latest amendment	2006	
	Reference to document	Parks and Trees Act 2005	

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>	Yes
	√ 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>	Yes
	√ 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	
National forest programme (nfp)	
Law (Act or Code) on forest with national scope	The Parks and Trees Act 2005 include regulations on the protection of Singapore's forests
Sub-national forest policy statements	
Sub-national Laws (Acts or Codes) on forest	

Other general comments to the table

## 15 Table T15 – Institutional framework

### 15.1 FRA 2010 Categories and definitions

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

### 15.2 Data for Table T15

Table 15a – Institutions

FRA 2010 Category	2008	
Minister responsible for forest policy formulation : please provide full title		
Level of subordination of Head of Forestry within the Ministry		1 <sup>st</sup> level subordination to Minister
		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	National Parks Board	
Institution(s) responsible for forest law enforcement		

Table 15b – Human resources

FRA 2010 Category	Human resources within public forest institutions					
	2000		2005		2008	
	Number	%Female	Number	%Female	Number	%Female
Total staff						
...of which with university degree or equivalent						

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		
Level of subordination of Head of Forestry within the Ministry		
Other public forest agencies at national level		
Institution(s) responsible for forest law enforcement		
Human resources within public forest institutions		

#### Other general comments to the table

Singapore does not have a ministry on forestry. The Conservation Division of the National Parks Board enforces relevant sections of the Parks and Trees Act 2005 pertaining to the protection of forests.

## 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 Original data

There are no forest-related education programme or forest research centres in Singapore.

### 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	0		0		0	
Bachelor's degree (BSc) or equivalent	0		0		0	
Forest technician certificate / diploma	0		0		0	
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)	0		0		0	
Master's degree (MSc) or equivalent	0		0		0	
Bachelor's degree (BSc) or equivalent	0		0		0	

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		
Professionals working in public forest research centres		

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 Original data

Singapore's policy is not to exploit timber and non-timber products from forest areas; therefore no forest revenue is generated.

### 17.3 Data for Table T17

Table 17a - Forest revenues

FRA 2010 Categories	Revenues (1000 local currency)	
	2000	2005
Forest revenue	0	0

**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						
Transfer payments						
<b>Total public expenditure</b>						
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				

**17.4 Comments to Table T17**

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

Other general comments to the table