Forestry Department
Food and Agriculture Organization of the United Nations

GLOBAL FOREST RESOURCES ASSESSMENT 2010

COUNTRY REPORT

SAMOA

FRA2010/182
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).

The Global Forest Resources Assessment process is coordinated by the Forestry Department at FAO headquarters in Rome. The contact person for matters related to FRA 2010 is:

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Report preparation and contact persons

No official report has been received from the country.

This report is the result of a desk study prepared by the FRA 2010 secretariat in Rome, which summarizes existing available information using the established format for FRA 2010 country reports.

1 Table T1 – Extent of Forest and Other wooded land

1.1 FRA 2010 Categories and definitions

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

1.2 National data

1.2.1 Data sources

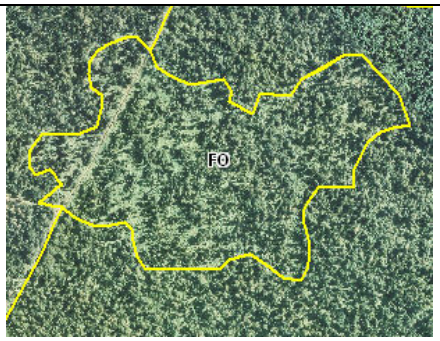
References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
SamFRIS[1] Database, Samoa Forestry Division, (2004)	H		2003	GIS based database, utilize 1999 aerial photos for forest mapping
The Forest Resources of Western Samoa (Inventory Report by P.F. Olsen & Company Ltd., Forest Consultants & Managers, 1978)	L		1976/77	Report focuses on merchantable
FAOSTAT	H	Total land area	2000	

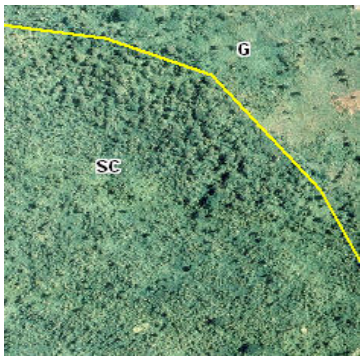
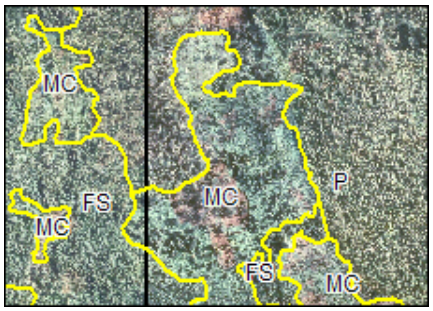
[1] Samoa Forest Resource Information System

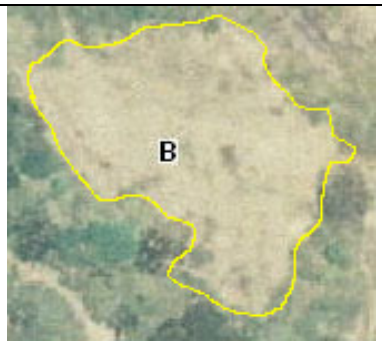
1.2.2 Classification and definitions

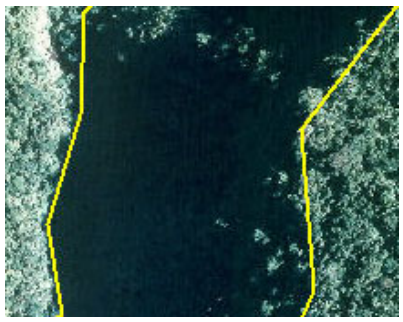
See classification and definitions on next page (including photo sample of particular vegetation types).

Major Class	Sub Class	Description	Photo Sample
FOREST		Land with a tree crown cover (or stocking level) of more than **10%** and a minimum area size of **1 hectare**. Includes man made plantation forests, mangrove forests and other natural forests of various canopy densities.	
Natural Forest		Forests that have established naturally, ie not planted by man	
Mangrove Forest **M**	-	Low-lying coastal areas inundated by saline or brackish water and containing mangrove vegetation, dominated by either *Brugguiera* or *Rhizophora* tree spp.	
Closed Forest **FC**	**- u** **- lo** **- c** **- w** **- n** **- sw**	Forest formations with various storeys and total crown coverage of more than **65 - 70%**. Includes primary forests as well as forests in an advanced status of reconstitution after logging, farming or other natural causes (fire, cyclone, etc.) (apparently) undisturbed logged over formerly cultivated windfall other natural causes swampy	
Medium Dense Forest **FM**	**- u** **- lo** **- c** **- w** **- n** **- sw** **- mm** **- fs**	Medium dense forest formations with discontinuous tree layer with one or more storeys and with a crown coverage of more than **40% and less than 65 - 70%**. (apparently) undisturbed logged over formerly cultivated windfall other natural causes swampy Merremia vines presence of secondary spp. (eg Albizzia)	

Major Class	Sub Class	Description	Photo Sample
Open Forest **FO**	 **- u** **- lo** **- c** **- w** **- n** **- sw** **- mm** **- fs**	Forest formations with a discontinuous tree layer but with a crown coverage of **at least 10% and less than 40%**. Includes highly degraded and depleted forest due to recent logging, farming or natural disasters (storms, fire, etc.) (apparently) undisturbed logged over formerly cultivated windfall other natural causes swampy Merremia vines presence of secondary spp. (eg Albizzia)	
Secondary Forest **FS**	 **- alb** **- lo** **- c** **- w** **- bl** **- n** **- mm** **- cn** **- mc** **- rv**	Secondary forest formations after clearing by man (agriculture, logging), wind, fire or other. Tree remnants and juvenile regeneration may be covered by climbing/creeping vines (*Merremia* and *Mikania*). Albizzia (tamaligi) logged over formerly cultivated windfall burnt land other natural causes Merremia vines presence of scattered coconut trees presence of mixed crops (eg. bananas, taamu, taro, breadfruit etc) presence of remnant vegetation of primary forest species	
Forest Plantation **FP**	 **- x**	Man-made forest stands established by planting and/or seeding. 'species'	
OTHER WOODED LAND		Land with a tree crown cover (or stocking level) of less than 10%. Includes scrub and woodland	

Major Class	Sub Class	Description	Photo Sample
Scrub **SC**	 **- f** **- l** **- h** **- tf** **- v** **- bl**	Areas with dominance of woody perennial shrubs of less than 5-7m height and without a definite crown. ground ferns littoral scrub; native shrubby vegetation occurring on the seaward side of coastal forests; dominated by dwarf shrubs up to 2-3m height hibiscus tree ferns volcanic lava flow burnt land	
OTHER LAND		Land not classified as forest or other wooded landmass defined above. Includes agricultural land, grass land, built-up areas and barren land etc	
Agriculture		Land permanently, or temporarily used for agricultural production	
Plantations **P**	 **- cn** **- cn/lp** **- co** **- b** **- cn/mc** **- cn/fs**	Permanent agricultural installations, mostly tree crops or continued / repeated planting of e.g. coconuts or banana (agro-industrial). coconut coconut with livestock production coffee / cocoa banana coconut mixed with other crops coconuts overgrown with secondary species	
Mixed Crops **MC**	 **- cn** **- cn/fs**	Land currently and recently cultivated with a mixture of herbaceous and tree crops such as root crops, taro, yam, cassava, breadfruit etc . This includes areas of current cropping and adjacent areas recently abandoned and now overgrown with secondary shrub and tree species. coconut coconuts overgrown with secondary species	
Open Land		All land not covered by forest, woody vegetation, or used for agriculture	

Major Class	Sub Class	Description	Photo Sample
Grass land **G**	 **- f** **- mw** **- lp** **- mc** **- fs** **- tf**	Open land dominated by herbaceous or grassy vegetation but often with scattered trees ground ferns marsh wetland with predominantly herbaceous vegetation covering flat areas of soil saturated with freshwater (inland craters) or brackish water (coastal marshes). livestock production presence of mixed crops (eg. bananas, taamu, taro, breadfruit etc) presence of secondary species presence of tree ferns	
Barren land **B**	 **- ro** **- s** **- q** **- bl** **- v**	All land lacking any vegetation cover; except for infrastructure and built-up areas. rocky sandy (incl. beaches) quarry site burnt land volcanic lava flow	
Built-Up area **BU**	 **- r** **- cd** **- gov** **- sch** **- o**	All settlement areas, encompasses continuous developments, industrial or commercial built-up areas and scattered isolated houses including gardens and inner-city parks. residential commercial development (eg new hotels) governmental school other	
Infrastructure **I**	 **- wh** **- sp** **- ap** **- lm**	All roads (hard surfaced or loose) and infrastructure related facilities (e.g. airports / airstrips, ports, wharves, sports compounds etc.) wharf Sports compound airport logging mill	
Inland Water		Areas occupied by major rivers, lakes, reservoirs and swamps	
Rivers **R**		Major rivers and creeks	
Lakes **L**	 **- wr** **- lg**	Lakes and waterbodies water reservoirs lagoons	

Major Class	Sub Class	Description	Photo Sample
Wetland **WL**	**- mw**	An area of wetland with a mixture of trees and herbaceous plants marsh wetland (predominantly herbaceous vegetation rather than trees (coastal or montane))	
Shadow SH		Shadow areas on flanks of steep valleys or ridges. No information about actual ground cover (but may be the same as adjacent ground cover so CHECK)	

1.2.3 Original data

Most recent data: Based on the 1999 Arial Photo Interpretation

Main Land Cover Type	Islands									
	Apolima	**Fanuatapu**	**Manono**	**Namua**	**Nuulua**	**Nuutele**	**Savaii**	**Upolu**	**Samoa**	**Percent of Samoa land area**
arren land	0.12				0.82		1973.42	30.29	2004.65	**0.71**
Built up areas	3.51		31.25				1771.84	5291.39	7097.99	**2.50**
Closed Forest						82.48			82.48	**0.03**
Medium Forest				9.27			72150.98	402.45	72562.7	**25.53**
Open Forest					13.77	12.97	22271.93	33049.35	55348.02	**19.48**
Plantation Forest							3797.68	1304.86	5102.54	**1.80**
Secondary Forest	23.93		53.76				19799.6	17295.96	37173.25	**13.08**
Grassland	1.98						5192.97	12299.16	17494.11	**6.16**
Infrastructure							31.8	431.67	463.47	**0.16**
Lakes							16.08	202.73	218.81	**0.08**
Mangroves							16.4	353.15	369.55	**0.13**
Mixed Crops	5.89		52.98				2463.02	7706.29	10228.18	**3.60**
Plantation	30.19		150.16			5.69	26157.89	26770.24	53114.17	**18.69**
Rivers							22.47	41.95	64.42	**0.02**
Scrub	31.77	5.7		5.32	6.36		15065.58	7000.06	22114.79	**7.78**
Wetland							147.75	597.38	745.13	**0.26**
Grand Total	**97.39**	**5.7**	**288.15**	**14.59**	**20.95**	**101.14**	**170879.41**	**112776.93**	**284184.26**	**100.00**

Some Preliminary Findings:

1. Forest Cover of Samoa is 60%. This is slightly higher than recorded in 1987. 69% of Savaii and 46% of Upolu are covered with forest.
2. Forest is highly degraded and "open" with many invasive weeds. Twenty (20%) of land cover is secondary forest and scrub
3. 80% of coconut plantations are poorly managed and overgrown with weedy trees

Comparison of 1999 forest cover maps with previous forest cover maps

The table below shows the percentage (%) of land area under forests c1954, c1987, c1990 and c1999.

Comparison of historical land area under forest in Samoa

Year	Upolu	Savaii	Total Samoa
c. 1954	65	79	74
c. 1987	43	63	55
c. 1990	*25*	*50*	*40*
c. 1999	46	69	60

Note: the 1990 figures are italicised because they are not directly comparable with the other figures. Sources of data: 1954 (Fox and Cumberland 1962); 1987 (ANZDEC 1990); 1990 (SFD 1994); 1999 (SamFRIS 2004).

From the above supplied data it seem to imply that there has been a 5% increase in forest cover in the period 1987 to 1999 (from 55% national forest cover to 60% forest cover). This however must be carefully noted and caution applied when interpreting as each finding (time series) uses different methodologies and different forest classifications. Only the 1954 and 1987 data are directly comparable with each other because they both used a similar definition of forest (Ward and Ashcroft) 1998). The 1990 SFD assessment defined the remaining area of primary mature forest so came up with a very low forest cover figure. The assessment of forest cover based on the 1999 aerial photographs was done at a higher mapping scale (1:5,000), mapped smaller forest units (down to 1ha) and identified more forest types (seven) than any other forest cover mapping previously done. Furthermore the assessment involved more detail and systematic ground truthing than ever done before for most of the historical forest cover maps.

Thus, the apparent increase in forest cover between 1987 and 1999 is probably an artifact. It is more likely that forest cover may have been slightly reduced since 1987. The fact that 32% of the total forest cover in 1999 was classified as open forest (less than 40% tree cover) and less than 0.05% was classified as closed forest indicates that the Samoan forest is now extremely open and patchy. Another 24% of the forest cover is classified as secondary regrowth forest. Although there is no data available for direct comparison, historical descriptions and personal observations prior to cyclones Ofa (1990) and Val (1993) suggested that Samoan forests were mostly closed canopy with a smaller element of secondary forest. The open nature of the Samoan forest in recent times and the spread of secondary forest species, many of which are non-native alien species, are cause for considerable concern.

1.3 Analysis and processing of national data

1.3.1 Calibration

Not needed. The total land area corresponds with FAOSTAT figures.

Source	Total area (1 000 ha)
National data	284
FAOSTAT	284
Calibration factor	

1.3.2 Estimation and forecasting

As explained in sections above, estimation and forecasting of trend data can not be done given lack of original and genuine data for the different time series, incomparability of the data given the different methodologies used to collect the data, different objectives and the different map scales used to map the forests. It is now agreed that the reclassification of forests and mapping work done with assistance of FAO (starting 2003) will now provide reference point for future work was done thoroughly and for the whole country.

Coming across these difficulties in analysing and calculating trend data, and experiencing lack of appropriate data, has forced Samoa Forestry Division to think hard and consider likely future options to improve on data and information collected and to make reporting easier. The Division now has complete satellite image coverage of the whole country taken in mid 2004. This will be used to update and improve current data and information held.

1.3.3 Reclassification into FRA 2010 categories

National classes	FRA categories				
	Forest	OWL	Other land	Inland water	OLWTC
Barren land			100%		
Built up areas			100%		
Closed forest	100%				
Medium forest	100%				
Open forest	100%				
Plantation forests	100%				
Secondary forests	100%				
Grassland			100%		
Infrastructure			100%		
Lakes				100%	
Mangroves	100%				
Mixed Crops					100%
Plantation (coconut)					100%
Rivers				100%	
Scrub		100%			
Wetlands				100%	

1.4 Data for Table T1

FRA 2010 categories	Area (1000 hectares)			
	1990	2000	2005	2010
Forest	130	171	171	171
Other wooded land	0	22	22	22
Other land	153	90	90	90
...of which with tree cover	n.a.	63	63	63
Inland water bodies	1	1	1	1
TOTAL	**284**	**284**	**284**	**284**

1.5 Comments to Table T1

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Forest		For the year 1990, the data on forest area is as reported in the 1990 FRA Report. It should be noted that though some figures for 1990 and previous years were presented in section 1.2.3 (original data), assessments and inventories yielding those data and information used different map scales and different forest classification systems thus are not comparable if trend data is to be calculated. For the year 2000, 2005 and, both years have same figures. This is so because, and as evident from current field survey findings, it is found that there is little or insignificant change in area of forests and other wooded land since 1999, when current aerial photos now used to do updates was flown.
Other wooded land		
Other land	For 1990 data, other wooded land is included in the other land category.	
Other land with tree cover		
Inland water bodies		

Other general comments to the table
Given the lack of genuine original data of previous years especially in the 1980s, and incomparability of existing data, the data for the year 2000 are being used as forecasts for FRA 2010 (also see note T1). Based on expert knowledge, it is strongly predicted that the change to forest cover will be insignificant hence area of forests and other wooded land will remain roughly the same. Indeed results from the latest forest mapping exercise undertaken by the Samoa Forestry Division in 2003 and 2004 confirm this fact. This is by comparing forest areas as recorded in the 1999 aerial photos against ground truthing exercises and field checks in 2003 and 2004. It was found that changes to area of forests and other wood lands have not changed much, or if there was, it was insignificant. However, in reality, it is anticipated that there will be some slight reduction in the overall forest area of the whole country in 2010 if on going level of logging activities and agriculture clearings continues unchecked or increases. The Division has total confidence in the 2000 data and findings as they have recently been produced and extracted from the SamFRIS database, a mapping and GIS based information system funded by FAO under the project "Strengthening the Institutional Capacity of the Samoa Forestry Division to Effectively Manage the country's forest resource". As discussed in section 1.2.4, the work associated with the 2000 data and information is done more thoroughly and with greater level of detail and accuracy. It will now be the reference point when doing future forest assessment or inventories and for reporting to FAO FRA work.

Expected year for completion of ongoing/planned <u>national</u> forest inventory and/or RS survey / mapping	
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.
Categories related to the holder of management rights of public forest resources	
Public Administration	The Public Administration (or institutions or corporations owned by the Public Administration) retains management rights and responsibilities within the limits specified by the legislation.
Individuals/households	Forest management rights and responsibilities are transferred from the Public Administration to individuals or households through long-term leases or management agreements.
Private institutions	Forest management rights and responsibilities are transferred from the Public Administration to corporations, other business entities, private co-operatives, private non-profit institutions and associations, etc., through long-term leases or management agreements.
Communities	Forest management rights and responsibilities are transferred from the Public Administration to local communities (including indigenous and tribal communities) through long-term leases or management agreements.
Other form of management rights	Forests for which the transfer of management rights does not belong to any of the categories mentioned above.

2.2 National data

2.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
SamFRIS Database, Samoa Forestry Division, (2004)	H		1999, 2003	

2.2.2 Classification and definitions

National class	Definition
Customary Land	Land owned, controlled and managed by indigenous Samoan people, village and communes
State Land	Land owned and managed by the Independent State of Samoa (the National Government)
Private Freehold Land	Land owned and controlled by private individuals
WESTEC[1] Land	Land owned and managed now by independent Government Statutory Body, Samoa Land Corporation (SLC).

1). Western Samoa Estate Corporation.

2.2.3 Original data

Samoa forests under different land tenure

Land tenure type	Forest area (1000 hectares)	Percentage of total land area
Customary Land	131.2	46.2
State Land	22.0	7.7
Private Freehold Land	3.2	1.1
Ex-Government Forestry Plantation Leases[1]	4.8	1.7
WESTEC Land	6.7	2.3
State Forest[2]	2.6	1.0
Non-forest land[3]	113.5	40
Total	284	100%

1) Land leased by the Government of Samoa for forest plantation development. As of 2003, all such land have now been returned to customary landowners including ownership and management of the forest plantations.
2) Government land, owned and managed by the Samoa Forestry Division with natural forests and forest plantations
3) Land not having any forest (includes build-up areas, agriculture lands and other non-forest land use etc)

2.3 Analysis and processing of national data

2.3.1 Calibration

Not needed.

2.3.2 Estimation and forecasting

The data for Samoa forests by land tenure is derived from SamFRIS database. SamFRIS has separate data layers depicting boundaries and areas of state land, freehold land, WESTEC land, ex-Government forest plantation leases and state forests. Using the forest cover map as a base map, different layers representing the different land tenures particularly the state land, freehold land and the WESTEC land are superimposed over the base map. The composite map produced showed areas of Samoa forests under the different land tenure categories and the area. Forest plantation leases and state forests are mapped and included in the forest cover map. Forests outside the above mentioned land tenure categories are automatically classified as those under customary land tenure.

2.3.3 Reclassification into FRA 2010 categories

National classes	FRA 2005 Categories Forest areas		
	Private ownership	**Public ownership**	**Other ownership**
Customary Land	100%		
State Land		100%	
Private Freehold Land	100%		
WESTEC[1] Land		100%	

	Public land	**Private land**	**Other ownership**
Other wooded land	90%	10%	

2.4 Data for Table T2

Table 2a - Forest ownership

FRA 2010 Categories	Forest area (1000 hectares)		
	1990	**2000**	**2005**
Public ownership	n.a.	36.1	36.1
Private ownership	n.a.	134.4	134.4
...of which owned by individuals	n.a.	n.a.	n.a.
...of which owned by private business entities and institutions	n.a.	n.a.	n.a.
...of which owned by local communities	n.a.	n.a.	n.a.
...of which owned by indigenous / tribal communities	n.a.	n.a.	n.a.
Other types of ownership	n.a.	0	0
TOTAL	**130**	**171**	**171**

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 **No** 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			
Individuals			
Private corporations and institutions			
Communities			
Other			
TOTAL			

2.5 Comments to Table T2

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

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.
Categories of primary designated functions	
Production	Forest area designated primarily for production of wood, fibre, bio-energy and/or non-wood forest products.
Protection of soil and water	Forest area designated primarily for protection of soil and water.
Conservation of biodiversity	Forest area designated primarily for conservation of biological diversity. Includes but is not limited to areas designated for biodiversity conservation within the protected areas.
Social services	Forest area designated primarily for social services.
Multiple use	Forest area designated primarily for more than one purpose and where none of these alone is considered as the predominant designated function.
Other	Forest areas designated primarily for a function other than production, protection, conservation, social services or multiple use.
No / unknown	No or unknown designation.
Special designation and management categories	
Area of permanent forest estate (PFE)	Forest area that is designated to be retained as forest and may not be converted to other land use.
Forest area within protected areas	Forest area within formally established protected areas independently of the purpose for which the protected areas were established.
Forest area under 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
Samoa Forestry Division, SamFRIS Database, (2004)	H		1999, 2003	
Atherton, J. GIS Design & Development, TCP/SAM/2901(A). Third Mission Final Report.	H		1999, 2003	

3.2.2 Classification and definitions

National class	Definition
Production forest	Forest that is not protected and available for production. Areas for production must comply with a number of requirements such slope, volume per hectare[1] and approval to log by customary land owners and village communities.
Protection forest	Includes national parks, reserves, community conservation areas and areas with slopes above 30 degrees. Critical or principal watercatchment areas also fall under this category of protected forests.

1) Merchantable or harvestable forests in Samoa must at least have 29m^3 per hectare. While this figure was stated as policy in the early 1980s, it is now not strictly adhered to given the existing poor quality of forests as a result of repeated cyclone damage and human interferences.

3.2.3 Original data

Samoa Protection and Production Forest Areas (ha)
(Based on 1999 aerial photo interpetation with 2004 ground truthing. Source: SamFRIS 2004)

Sum of AREA		ISLAND_NAME								
FOREST_STATUS	MAIN_VEG_TYPE	Apolima	Manono	Namua	Nuulua	Nuutele	Savaii	Upolu	Grand Total	**Percent of Samoa**
production forest	FM						18050.29	247.7	18297.99	
	FO						18445.88	16763.02	35208.9	
	FP						3701.72	1011.19	4712.91	
	FS	23.93	53.76				18146.82	10824.56	29049.07	
	M							0	0	
	WL							0	0	
production forest Total		23.93	53.76				58344.71	28846.47	87268.87	**30.71**
protection forest	FC					82.48			82.48	
	FM			9.27			54100.67	154.75	54264.69	
	FO				13.77	12.97	3826.05	16286.28	20139.07	
	FP						95.96	293.66	389.62	
	FS						1652.76	6471.4	8124.16	
	M						16.4	353.15	369.55	
	WL						16.85	417.67	434.52	
protection forest Total				9.27	13.77	95.45	59708.69	23976.91	83804.09	**29.49**
Grand Total		23.93	53.76	9.27	13.77	95.45	118053.4	52823.38	171072.96	**60.20**

Notes: 1. Protection forest consists of the following land uses: existing and proposed national parks and reserves, community conservation areas, areas above 30% slope (proposed forest conservation areas) and critical catchment areas. Many of these areas may not be actively protected except on paper.
2. "Production" forest does not imply that the area is suitable for production, merely that it is forest land that is not protected and is theoretically available for production. Areas actually suitable for production must satisfy a number of other criteria such as have a suitable timber volume of merchantable timber species, be accessible and have community support for logging,

			Percent of Samoa
Non Forest		113111.2	39.80
Forest	*Protection Forest*	*83804.09*	*29.49*
	Production Forest	*87268.87*	*30.71*
	Total Forest	171073.06	60.20
Land Area Samoa		284184.26	100.00

3.3 Analysis and processing of national data

3.3.1 Calibration

Not needed.

3.3.2 Estimation and forecasting

The estimation and forecasting of production and protected forests are based on information supplied by the Samoa Forestry Division (SFD) and the Department of Lands, Survey and Environment (DLSE). For production forests, the SamFRIS database is used to identify and pick out all forest areas that satisfied the criteria for harvesting. These forests are then labelled as merchantable forests. For the protection forests, the information supplied by DLSE is used. This includes maps and boundaries of all national parks, reserves, community conservation areas, watershed catchment areas and areas identified as having potential or unique values that required protecting for national interests

3.3.3 Reclassification into FRA 2010 categories

Analysis of areas with functions designated by legal or administrative prescriptions:

Total **production area**	87.2 thousand ha.		
… of which forest	90%	or	78.5 thousand ha
… of which OWL	10%	or	8.7 thousand ha
Total **protection area**	83.8 thousand ha.		
… of which forest	85%	or	71.2 thousand ha
… of which OWL	15%	or	12.6 thousand ha

Reclassification to FRA 2005 categories for "primary function"

	Production areas		Protected areas	
	Forests	OWL	Forests	OWL
Area (1000 ha)	78.5	8.7	71.2	12.6
Production	100%	100%		
Protection of soil and water			40%	50%
Conservation of biodiversity			40%	10%
Social Services			10%	10%
Multiple purposes				10%
No or unknown designation			10%	20%
Total	100%	100%	100%	100%

The reclassification percentages assigned here are based on expert knowledge

	Production areas		Protected areas	
	Forests	**OWL**	**Forests**	**OWL**
Area (1000 ha)	**78.5**	**8.7**	**71.2**	**12.6**
Production	78.5	8.7		
Protection of soil and water			28.5	6.3
Conservation of biodiversity			28.5	1.3
Social Services			7.1	1.3
Multiple purposes				1.3
No or unknown designation			7.1	2.4
Total	**78.5**	**8.7**	**71.2**	**12.6**

Analysis of forest areas without a prescribed designated function

Total designated forest is is 149.7 thousand ha (78.5 + 71.2)

Forest area without prescribed designated area is 21.3 thousand ha. (171 thousand ha total forest area minus 149.7 thousand ha.)

Assessment/classification of forest areas without any prescribed designated function

Primary designated function	**Assessed percentage**[1]	**Area (1000 ha)**
Production	10	2.1
Protection of soil & water	30	6.4
Conservation of biodiversity	0	0
Social services	0	0
Multiple purpose	40	8.5
No or unknown designation	20	4.3
Total	**100%**	**21.3**

1) Assessed percentage of the total area without any prescribed designated function is based on expert knowledge.

3.4 Data for Table T3

Table 3a – Primary designated function

FRA 2010 Categories	**Forest area (1000 hectares)**			
	1990	**2000**	**2005**	**2010**
Production	n.a.	80.6	80.6	80.6
Protection of soil and water	n.a.	34.9	34.9	34.9
Conservation of biodiversity	n.a.	28.5	28.5	28.5
Social services	n.a.	7.1	7.1	7.1
Multiple use	n.a.	8.5	8.5	8.5
Other (please specify in comments below the table)	n.a.	0	0	0
No / unknown	n.a.	11.4	11.4	11.4
TOTAL	**n.a.**	**171**	**171**	**171**

Table 3b – Special designation and management categories

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

3.5 Comments to Table T3

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

Other general comments to the table
The national data or original data covers both production and protected forests (see definition provided above). Expert knowledge is used to reclassify and allocate areas under the FRA categories. Again as for Table 1 (T1) above, expert knowledge and ground checks by Samoa Forestry Division anticipates little or insignificant changes in the area figures for the different categories, hence the 2005 and 2010 figures will be similar to 2000 figures. In Samoa areas categorize as protection forests are closely controlled and monitored by the Environment Division to minimise encroachments and unauthorized developments such as clearing of forests for cultivation of agricultural crops.

4 Table T4 – Forest characteristics

4.1 FRA 2010 Categories and definitions

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

4.2 National data

4.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Samoa Forestry Division, SamFRIS Database, (2004)	H		1999, 2003	
Atherton, J. GIS Design & Development, TCP/SAM/2901(A). Third Mission Final Report.	H		1999, 2003	

4.2.2 Classification and definitions

National class	Definition
Close Forests (FC)	Forest formations with various storeys and total crown coverage of more than **65 - 70%**. Includes primary forests as well as forests in an advanced status of reconstitution after logging, farming or other natural causes (fire, cyclone, etc.)
Medium Dense Forests (FM)	Medium dense forest formations with discontinuous tree layer with one or more storeys and with a crown coverage of more than **40% and less than 65 - 70%**.
Open Forests (FO)	Forest formations with a discontinuous tree layer but with a crown coverage of **at least 10% and less than 40%**. Includes highly degraded and depleted forest due to recent logging, farming or natural disasters (storms, fire, etc.)
Secondary Forests (FS)	Secondary forest formations after clearing by man (agriculture, logging), wind, fire or other. Tree remnants and juvenile regeneration may be covered by climbing/creeping vines (*Merremia* and *Mikania*).
Forest Plantation (FP)	Man-made forest stands established by planting and/or seeding.
Mangrove Forests (M)	Low-lying coastal areas inundated by saline or brackish water and containing mangrove vegetation, dominated by either *Brugguiera* or *Rhizophora* tree spp.
Wetland (WL)	An area of wetland with a mixture of trees and herbaceous plants

1) Refer to national forest classification table for detail and supplementary notes.

4.2.3 Original data

National class	Area (1000 ha)
Close Forests (FC)	0.1
Medium Dense Forests (FM)	72.3
Open Forests (FO)	55.3
Secondary Forests (FS)	37.2
Forest Plantation (FP)	5.0
Mangrove Forests (M)	0.4
Wetland (WL)	0.7
Total	171

4.3 Analysis and processing of national data

The reported data on forest characteristics for FRA 2005 has been used for input. It is assumed that the reported area on “Modified natural forest” and “Semi-natural forest” in FRA 2005 corresponds to the FRA 2010 reporting category of “Other natural regenerated forest”. It is further assumed that the sum of the FRA 2005 categories “Productive plantation” and “Protective plantation” correspond to the FRA 2010 reporting category “Planted forest”.

4.3.1 Calibration

Not needed.

4.3.2 Estimation and forecasting

The estimation and forecasting is made using the SamFRIS database. SamFRIS is queried to map all forest that correspond closely to the definition of the characteristics of forest that is given in the categories above, namely primary forests, modified natural, semi natural, productive plantation and protective plantation.

4.3.3 Reclassification into FRA 2010 categories

National classes	**FRA 2005 Category** **Forests**
FC	100%
FM	100%
FO	100%
FS	100%
FP	100%
M	100%
WL	100%

National classes	**FRA 2005 Categories** **Forests**				
	Primary	Modified natural	Semi-natural	Productive plantation	Protective plantation
FC	20%	50%	30%		
FM		60%	20%	20%	
FO		80%	10%		10%
FS		60%	20%	10%	10%
FP			20%	60%	20%
M			30%	20%	50%
WL		20%	20%		60%

1) Percentage of area under different characteristic is made based on expert knowledge

National classes	FRA 2005 Categories Forests				
	Primary	Modified natural	Semi-natural	Productive plantation	Protective plantation
FC	0.02	0.05	0.03		
FM		43.4	14.5	14.5	
FO		44.2	5.5		5.5
FS		22.3	7.4	3.7	3.7
FP			1.0	3.0	1.0
M			0.1	0.08	0.2
WL		0.1	0.1		0.4
Total	0.02	110.0	28.6	21.3	10.8

4.4 Data for Table T4

Table 4a

FRA 2010 Categories	Forest area (1000 hectares)			
	1990	2000	2005	2010
Primary forest	n.a.	0.02	0.02	0.02
Other naturally regenerated forest	n.a.	138.6	138.6	138.6
...of which of introduced species	n.a.	n.a.	n.a.	n.a.
Planted forest	n.a.	32.1	32.1	32.1
...of which of introduced species	n.a.	n.a.	n.a.	n.a.
TOTAL	**n.a.**	**171**	**171**	**171**

Table 4b

FRA 2010 Categories	Area (1000 hectares)			
	1990	2000	2005	2010
Rubber plantations (Forest)	n.a.	n.a.	n.a.	n.a.
Mangroves (Forest and OWL)	n.a.	n.a.	n.a.	n.a.
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		
Other naturally regenerating forest		
Planted forest		
Rubber plantations		
Mangroves		
Bamboo		

Other general comments to the table

5 Table T5 – Forest establishment and reforestation

Information is not available for this reporting table.

6 Table T6 – Growing stock

Information is not available for this reporting table.

7 Table T7 – Biomass stock

Information is not available for this reporting table.

8 Table T8 – Carbon stock

Information is not available for this reporting table.

9 Table T9 – Forest fires

Information is not available for this reporting table.

10 Table T10 – Other disturbances affecting forest health and vitality

Information is not available for this reporting table.

11 Table T11 – Wood removals and value of removals

11.1 FRA 2010 Categories and definitions

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

11.2 National data

11.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
FAOSTAT. 2009	M	Industrial roundwood, Wood fuel	All	

11.2.2 Original data

	Removals m3 u.b.				
	1988	**1989**	**1990**	**1991**	**1992**
Industrial Roundwood	61000	61000	61000	61000	61000
Wood Fuel	70000	70000	70000	70000	70000
	1998	**1999**	**2000**	**2001**	**2002**
Industrial Roundwood	61000	61000	61000	61000	61000
Wood Fuel	70000	70000	70000	70000	70000
	2003	**2004**	**2005**	**2006**	**2007**
Industrial Roundwood	61000	61000	61000	61000	61000
Wood Fuel	70000	70000	70000	70000	70000

11.3 Analysis and processing of national data

A conversion factor of 1.15 was used to convert volume under bark to volume over bark.

	Removals m3 o.b. (5-year average)		
	1990	**2000**	**2005**
Industrial Roundwood	70150	70150	70150
Wood Fuel	80500	80500	80500

11.4 Data for Table T11

FRA 2010 Category	Industrial roundwood removals			Woodfuel removals		
	1990	2000	2005	1990	2000	2005
Total volume (1000 m^3 o.b.)	70.15	70.15	70.15	80.50	80.50	80.50
... of which from forest	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Unit value (local currency / m^3 o.b.)	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Total value (1000 local currency)	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

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

	1990	2000	2005
Name of local currency			

11.5 Comments to Table T11

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Total volume of industrial roundwood removals		
Total volume of woodfuel removals		
Unit value		
Total value		

Other general comments to the table

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

Data is not available for this reporting table.

13 Table T13 – Employment

Data is not available for this reporting table.

14 Table T14 – Policy and legal framework

Data is not available for this reporting table.

15 Table T15 – Institutional framework

Data is not available for this reporting table.

16 Table T16 – Education and research

Data is not available for this reporting table.

17 Table T17 – Public revenue collection and expenditure

Data is not available for this reporting table.