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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).

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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.

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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
Donnegan, J. A., S. S. Mann, S. L. Butler, and B. A. Hiserote. 2004. American Samoa's Forest Resources, 2001. Resource Bulletin PNW-RB-244, USDA Forest Service, Pacific Northwest Research Station, Portland, OR.	H	Land cover	2000	A five class land cover map was derived from IKONOS satellite data (1m resolution). Classes included: forest, nonforest vegetation, barren land, urban, and inland water. Complete coverage except Swain's Island and Rose Atoll.
Cole, T. G., C. D. Whitesell, W. A. Whistler, N. McKay, and A. H. Ambacher. 1988. Vegetation survey and forest inventory, American Samoa. Resour. Bull. PSW-RB-25, USDA Forest Service, Berkeley, CA.	H	Land cover	1986	Aerial photo interpretation was conducted on 1984 1:10,000 black & white photography and updated to 1986 with ground verification in that year. Complete coverage except Swain's Island and Rose Atoll.

1.2.2 Classification and definitions

National class	Definition
Forest land	Land spanning more than 0.5 hectares and a tree canopy cover of more than 10 percent.
Unreserved forest land	Forest land available for wood removals.
Protected forest land	Forest land that is not available for wood removals.
Mangrove	Specific wetland forest land of mangrove tree species.
Nonforest urban	Land used primarily for urban purposes.
Nonforest vegetation	Land characterized primarily by non-tree species or <10% canopy cover of trees.
Barren lands	Lands with exposed soil, rock, or sand, devoid of vegetation.
Water	Inland water bodies generally include major rivers, lakes and water reservoirs.

1.2.3 Original data

Estimated land area, 1986 and 2001

Land status	1986 hectares				2001 hectares			
	Ta'u	Ofu and Olosega	Tutuila and Aunu'u	Total	Ta'u	Ofu and Olosega	Tutuila and Aunu'u	Total
Forest land:								
Unreserved forest land	4,386	1,205	12,536	18,126	2,877	587	11,075	14,540
Protected forest land (National Park Service lease and reserves) ^a	—	—	—	—	1,502	611	956	3,068
Mangrove ^b	—	—	60	60	—	—	49	49
All forest land	4,386	1,205	12,595	18,186	4,378	1,197	12,081	17,657
Nonforest and other areas:								
Nonforest urban	47	13	911	972	51	15	1,363	1,429
Nonforest vegetation	94	38	314	447	63	19	207	289
Barren lands	—	—	6	6	53	30	139	222
Water	—	—	26	26	—	—	4 ^c	4 ^c
All nonforest, other & inland water	141	52	1,257	1,450	167	64	1,713	1,944
Total area (hectares)	4,527	1,257	13,852	19,636	4,545	1,261	13,793	19,601

Notes: Land area figures for 2001 acreage differ slightly from published survey area owing to boundary edges being constrained to square pixels on our satellite-image-derived vegetation map. Land area figures for 1986 acreage are computed from Cole et al. (1988) USDA Forest Service vegetation maps that were scanned and digitized for a geographic information system by USDA Forest Service, FIA in 2002.

^a Estimates of protected forest land acreage are from: Graves, 2003.

^b Unpublished data from global positioning system survey by American Samoa Forestry Division and American Samoa Community College.

^c Inland water figures from satellite imagery are coarse level estimates. However, some change between 1986 and 2001 are expected due to filling of mangroves and wetland.

1.3 Analysis and processing of national data

1.3.1 Calibration

FAOSTAT total area = 20,000 ha

Calibration factor 1986 = $(20,000/19,636) = 1.01853738$

Calibration factor 2001 = $(20,000/19,601) = 1.020356104$

	Original data		Calibration to FAOSTAT	
	1986	2001	1986	2001
	<i>Hectares</i>			
All forest land	18,186	17,657	18,523	18,016
Other land	1,450	1,944	1,477	1,984
Water	0	0	0	0
Total	19,636	19,601	20,000	20,000

1.3.2 Estimation and forecasting

	Estimation & Forecasting			1990	2000	2005
	Δ yrs	Δ area	Δ per year			
	<i>Hectares</i>					
All forest land	15	-507	-33.779538	18,388	18,050	17,881

^a Inland water figures are from FAOSTAT, however, original data show inland water was present and some change occurred between 1986 and 2001, probably as a result of filling of mangroves and wetland.

Other land is calculated as the difference of total land area minus forest land.

1.4 Reclassification into FRA 2005 classes

FAOSTAT reports no inland water for American Samoa (rounding of very small areas). Original data shows there was some decrease in inland water. Inland water in original data is added to Other land. No other reclassification was necessary.

1.5 Data for National reporting table T1

FRA 2005 Categories	Area (1000 hectares)		
	1990	2000	2005
Forest	18.388 ^a	18.050 ^a	17.881
Other wooded land			
Other land	1.612	1.950	2.119
...of which with tree cover			
Inland water bodies	0	0	0
TOTAL	20.000	20.000	20.000

^a FRA 2000 reported Forest area of 12,000 ha in 1990 and 2000. This figure is based on the original data from 1986 and did not include agroforests and secondary vegetation, which were classified as forest fallow (5000 ha) and as shrubs (1000 ha). These areas have been included in the above analysis to maintain consistency with the 2001 inventory that did not try to separate gradations of secondary forests and reverting agroforests from forested lands.

1.6 Comments to National reporting table T1

Area of forested lands includes agroforest and plantation lands and thus differs from the FRA 2005 definitions of forest. Agroforest grades into native forest and is often only a minor component around urbanized areas in the form of tree gardens amongst the overstorey. Plantation lands can be significant in American Samoa, especially coconut plantations, but the plantations are being abandoned and converting to secondary forest as the market for copra (dried coconut) has dramatically declined.

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
Office of Insular Affairs Department of the Interior Post Office Box 1725 Pago, American Samoa 96799	M	Land ownership	1990	See section 2.6 for descriptive information on ownership.

2.2.2 Classification and definitions

No national classification exists for ownership.

2.2.3 Original data

No data exist for forest ownership. See section 2.3 for qualitative information.

2.3 Data for National reporting table T2

FRA 2005 Categories	Area (1000 hectares)			
	Forest		Other wooded land	
	1990	2000	1990	2000
Private ownership				
Public ownership				
Other ownership				
TOTAL	NDA	NDA	NDA	NDA

2.4 Comments to National reporting table T2

Nearly all land on American Samoa is communally owned. Few private parcels exist. From the Office of Insular Affairs: “About 90 percent of the land is communally owned by aiga [the extended family]. The existing tenure law on communal lands prohibits alienation of any real property except freehold land to any person whose blood is less than one-half Samoan. Unless the Governor approves the transfer in writing, it is unlawful for any matai [the head of each aiga, a position which connotes authority] of a Samoan family to alienate any family lands to any person or lease it for any term more than 55 years. American Samoa Government estimates that 1.5625 square miles [405 ha] of American Samoa's total area of 76.1 square miles [19710 ha] are freehold land.”

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
Nelson, R. E. 1964. A look at the forests of American Samoa. Research Note PSW-RN-53, U.S.Department of Agriculture, Forest Service, Pacific Southwest Forest and Range Experiment Station, Honolulu, HI.	M	Forest functions.	1964	The comments Nelson made in 1964 regarding the forests of American Samoa are still valid today. See his comments in section 3.6.

3.2.2 Classification and definitions

No national classification and definitions exist.

3.2.3 Original data

No original data exist, however, all forests are considered to serve multiple functions.

3.3 Data for National reporting table T3

FRA 2005 Categories / Designated function	Area (1000 hectares)					
	Primary function			Total area with function		
	1990	2000	2005	1990	2000	2005
Forest						
Production				18.388	18.050	17.881
Protection of soil and water				18.388	18.050	17.881
Conservation of biodiversity				18.388	18.050	17.881
Social services				18.388	18.050	17.881
Multiple purpose	18.388	18.050	17.881	not appl.	not appl.	not appl.
No or unknown function				not appl.	not appl.	not appl.
Total - Forest	18.388	18.050	17.881	not appl.	not appl.	not appl.
Other wooded land						
Production						
Protection of soil and water						
Conservation of biodiversity						
Social services						
Multiple purpose				not appl.	not appl.	not appl.
No or unknown function				not appl.	not appl.	not appl.
Total – Other wooded land				not appl.	not appl.	not appl.

3.4 Comments to National reporting table T3

Forested lands in American Samoa simultaneously serve production, protection, conservation, and social service uses. From Nelson (1964): “The forested watersheds help insure quantity and quality of water supplies by moderating runoff and protecting soil from erosion and resulting stream siltation.... The scenic beauty and recreation potential of the forests are of great value... An interesting bird life dwells in the forest habitat.... Many useful products are now derived from the forests.... The [American] Samoans continue to depend on the native forest for many of their needs although imported substitutes play an increasing role.”

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 Classification and definitions

No national classification exists for forest characteristics.

4.2.2 Original data

No original data exists on forest characteristics according to FRA 2005 categories.

4.3 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						
Semi-natural						
Productive plantation						
Protective plantation						
TOTAL	NDA	NDA	NDA	NDA	NDA	NDA

4.4 Comments to National reporting table T4

No data are available to estimate area of land according to FRA 2005 categories. National Park designation was recent (1988) and cannot be assumed to be primary forest.

5 Table T5 – Growing stock

5.1 FRA 2005 Categories and definitions

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

5.2 National data

5.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Donnegan, J. A., S. S. Mann, S. L. Butler, and B. A. Hiserote. 2004. American Samoa's Forest Resources, 2001. Resource Bulletin PNW-RB-244, USDA Forest Service, Pacific Northwest Research Station, Portland, OR.	H	Wood volume	2001	Data derived from 21 - 670 sq. m field plots where tree diameters and heights were measured.
Cole, T. G., C. D. Whitesell, W. A. Whistler, N. McKay, and A. H. Ambacher. 1988. Vegetation survey and forest inventory, American Samoa. Resour. Bull. PSW-RB-25, USDA Forest Service, Berkeley, CA.	H	Wood volume	1986	Data derived from 20 variable-radius field plots where tree diameters and heights were measured. Volume data for 1986 was recalculated in Donnegan et al. 2004. Volume data originally given for production timberland only.

5.2.2 Classification and definitions

National class	Definition
Gross volume	Wood volume of the tree stem, from the ground to a height where the diameter equals 2.5 cm.
Net volume	Wood volume of the tree stem, from the ground to a height where the diameter equals 2.5 cm, minus portions of the stem that are rotten or missing.

5.2.3 Original data

2001:

Size class	<12.7 cm	12.7 - 28 cm	28.1 - 51 cm	51.1+ cm	All sizes
Forest land	<i>Cubic meters</i>				
Gross volume	158,335	742,158	702,286	444,273	2,047,053
Net volume	Not computed	739,969	693,616	440,412	1,873,997

1986:

Timberland*	<i>Cubic meters</i>
Net volume	903,164

*Timberland is a subset of forest land volume that is classified on the basis of higher productivity (Cole et al. 1986).

5.3 Analysis and processing of national data

5.3.1 Calibration

The 1986 ratio of timberland area to forest land area was used to estimate the amount of timberland in 2001. Volume per hectare on forest land was estimated for 1986 timberland and 2001 forest land. These volume per hectare estimates were applied to estimate forest land volume for 1986 and timberland volume for 2001. Net forest land volume is reported in table 5.

5.3.2 Estimation and forecasting

Original data					Estimated/forecasted data		
1986	2001	Δ yrs	Δ Volume	Δ per year	1990	2000	2005
1,926,702	1,873,997	15	-52,704	-3,514	1,912,647	1,877,511	1,859,943

5.4 Reclassification into FRA 2005 classes

No reclassification was performed. Net volume data was used for FRA.

5.5 Data for National reporting table T5

FRA 2005 Categories	Volume (million cubic meters over bark)					
	Forest			Other wooded land		
	1990	2000	2005	1990	2000	2005
Growing stock	1.912647	1.877511	1.859943			
Commercial growing stock	NDA	NDA	NDA	NDA	NDA	NDA

Specification of country threshold values	Unit	Value	Complementary information
1. Minimum diameter at breast height of trees included in Growing stock (X)	cm	12.7	
2. Minimum diameter at the top end of stem (Y) for calculation of Growing stock	cm	1986=10 2001=2.5	
3. Minimum diameter of branches included in Growing stock (W)	cm	NDA	
4. Minimum diameter at breast height of trees in Commercial growing stock (Z)	cm	NDA	
5. Volume refers to “Above ground” (AG) or “Above stump” (AS)	AG / AS	1986=AS 2001=AG	
6. Have any of the above thresholds (points 1 to 4) changed since 1990	Yes/No	Yes	
7. If yes, then attach a separate note giving details of the change	Attachment	See #2 and # 5.	

5.6 Comments to National reporting table T5

The volume data for 1986 originally was estimated only for the most productive subset of forest land. Per-hectare volume on forest land in 2001 was used here to estimate per-hectare volume on forest land in 1986 using the proportion of the respective land areas in each productivity class.

6 Table T6 – Biomass stock

6.1 FRA 2005 Categories and definitions

Category	Definition
Above-ground biomass	All living biomass above the soil including stem, stump, branches, bark, seeds, and foliage.
Below-ground biomass	All living biomass of live roots. Fine roots of less than 2mm diameter are excluded because these often cannot be distinguished empirically from soil organic matter or litter.
Dead wood biomass	All non-living woody biomass not contained in the litter, either standing, lying on the ground, or in the soil. Dead wood includes wood lying on the surface, dead roots, and stumps larger than or equal to 10 cm in diameter or any other diameter used by the country.

6.2 National data

6.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Donnegan, J. A., S. S. Mann, S. L. Butler, and B. A. Hiserote. 2004. American Samoa's Forest Resources, 2001. Resource Bulletin PNW-RB-244, USDA Forest Service, Pacific Northwest Research Station, Portland, OR.	H	Aboveground stem biomass.	2001	Cited publication provides species level aboveground biomass data. For the FRA 2005 report, averages were used derived from stem volumes.
Cole, T. G., C. D. Whitesell, W. A. Whistler, N. McKay, and A. H. Ambacher. 1988. Vegetation survey and forest inventory, American Samoa. Resour. Bull. PSW-RB-25, USDA Forest Service, Berkeley, CA.	M	Timberland volume	1986	Biomass estimates for FRA 2005 derived from timberland volume cited in Cole et al. 1988.

6.2.2 Classification and definitions

No national classification for biomass was used.

6.2.3 Original data

Wood volume on forest land was used to estimate biomass.

6.3 Analysis and processing of national data

6.3.1 Calibration

Biomass was calculated using total stem volumes and an average wood density (0.5), biomass expansion factor (3.4), and aboveground to belowground ratio estimator (0.24).

6.3.2 Estimation and forecasting

See section 5.31.

6.4 Data for National reporting table T6

FRA 2005 Categories	Biomass (million metric tonnes oven-dry weight)					
	Forest			Other wooded land		
	1990	2000	2005	1990	2000	2005
Above-ground biomass	3.251500321	3.191768886	3.161903169			
Below-ground biomass	0.780360077	0.766024533	0.758856761			
Dead wood biomass	NDA	NDA	NDA			
TOTAL	4.031860397	3.957793419	3.920759929	NDA	NDA	NDA

Thresholds used by the country are the following:
Same as for volume in table 5.

6.5 Comments to National reporting table T6

Original data used species specific wood density in 11 out of 51 cases. The data presented in table 6 estimates biomass from the volume estimates presented in table 5.

7 Table T7 – Carbon stock

7.1 FRA 2005 Categories and definitions

Category	Definition
Carbon in above-ground biomass	Carbon in all living biomass above the soil, including stem, stump, branches, bark, seeds, and foliage.
Carbon in below-ground biomass	Carbon in all living biomass of live roots. Fine roots of less than 2 mm diameter are excluded, because these often cannot be distinguished empirically from soil organic matter or litter.
Carbon in dead wood biomass	Carbon in all non-living woody biomass not contained in the litter, either standing, lying on the ground, or in the soil. Dead wood includes wood lying on the surface, dead roots, and stumps larger than or equal to 10 cm in diameter or any other diameter used by the country.
Carbon in litter	Carbon in all non-living biomass with a diameter less than a minimum diameter chose by the country for lying dead (for example 10 cm), in various states of decomposition above the mineral or organic soil. This includes the litter, fomic, and humic layers.
Soil carbon	Organic carbon in mineral and organic soils (including peat) to a specified depth chosen by the country and applied consistently through the time series.

7.2 National data

7.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Donnegan, J. A., S. S. Mann, S. L. Butler, and B. A. Hiserote. 2004. American Samoa's Forest Resources, 2001. Resource Bulletin PNW-RB-244, USDA Forest Service, Pacific Northwest Research Station, Portland, OR.	H	Carbon stock	2001	Cited publication provides species level carbon stock data. For the FRA 2005 report, averages were used derived from stem volumes.
Cole, T. G., C. D. Whitesell, W. A. Whistler, N. McKay, and A. H. Ambacher. 1988. Vegetation survey and forest inventory, American Samoa. Resour. Bull. PSW-RB-25, USDA Forest Service, Berkeley, CA.	M	Wood volume on timberland	1986	
Penman, J., M. Gytarsky, T. Hiraishi, T. Krug, D. Kruger, R. Pipatti, L. Buendia, K. Miwa, T. Ngara, K. Tanabe, and F. Wagner, editors. 2003. Good Practice Guidance	M	Carbon mass conversion factors, biomass expansion factors and ratio of	2003	

for Land Use, Land-Use Change and Forestry. Intergovernmental Panel on Climate Change, National Greenhouse Gas Inventories Programme, Institute for Global Environmental Strategies (IGES), Hayama, Kanagawa, Japan..		aboveground to belowground biomass.		
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7.2.2 Classification and definitions

National class	Definition
Weight of stem carbon	Mass of carbon in main stem of trees from the ground to a height where the diameter equals 2.5 cm.

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

7.2.3 Original data

Wood volume on forest land was used to estimate biomass.

7.3 Analysis and processing of national data

7.3.1 Calibration

Same as table 5.

7.3.2 Estimation and forecasting

Same as table 5.

7.4 Reclassification into FRA 2005 classes

None.

7.5 Data for National reporting table T7

FRA 2005 Categories	Carbon (Million metric tonnes)					
	Forest			Other wooded land		
	1990	2000	2005	1990	2000	2005
Carbon in above-ground biomass	1.62575	1.59588	1.58095			
Carbon in below-ground biomass	0.39018	0.38301	0.37942			
Sub-total: Carbon in living biomass	2.01593	1.97889	1.96037			
Carbon in dead wood	NDA	NDA	NDA			
Carbon in litter	NDA	NDA	NDA			
Sub-total: Carbon in dead wood and litter	NDA	NDA	NDA			
Soil carbon to a depth of _____ cm	NDA	NDA	NDA			
TOTAL CARBON	2.01593	1.97889	1.96037	NDA	NDA	NDA

7.6 Comments to National reporting table T7

Biomass numbers were reduced by 50% to calculate carbon stocks.

8 Table T8 – Disturbances affecting health and vitality

8.1 FRA 2005 Categories and definitions

Category	Definition
Disturbance by fire	Disturbance caused by wildfire, independently whether it broke out inside or outside the forest/OWL.
Disturbance by insects	Disturbance caused by insect pests that are detrimental to tree health.
Disturbance by diseases	Disturbance caused by diseases attributable to pathogens, such as a bacteria, fungi, phytoplasma or virus.
Other disturbance	Disturbance caused by other factors than fire, insects or diseases.

8.2 National data

8.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Donnegan, J. A., S. S. Mann, S. L. Butler, and B. A. Hiserote. 2004. American Samoa's Forest Resources, 2001. Resource Bulletin PNW-RB-244, USDA Forest Service, Pacific Northwest Research Station, Portland, OR.	M	Disturbance	2001	Data collection is extensive on the field plots, but the sample of 21 plots may not be sufficient to capture disturbance for the entire island group.

8.2.2 Classification and definitions

National class	Definition
None - no observable disturbance	
Insect damage	Disturbance caused by insect pests that are detrimental to tree health.
insect damage to understory vegetation	
insect damage to trees, including seedlings and saplings	
Disease damage	Disturbance caused by diseases attributable to pathogens, such as a bacteria, fungi, phytoplasma or virus.
disease damage to understory vegetation	
disease damage to trees, including seedlings and saplings	
Fire (from crown and ground fire, either prescribed or natural)	Disturbance caused by wildfire, independently whether it broke out inside or outside the forest/OWL.
ground fire	
crown fire	
Animal damage	Significant damage caused by feeding and rooting animals.
beaver (includes flooding caused by beaver)	
porcupine	

deer/ungulate	
bear	
rabbit	
domestic animal/livestock (includes grazing):	
pigs, wild boars	
Weather damage	Damage caused by specific weather agents.
ice	
wind (includes typhoon, hurricane, tornado)	
flooding (weather induced)	
drought	
earth movement/avalanches	
erosion	
Vegetation (suppression, competition, vines)	Disturbance caused by physical effects of one plant on another. Generally limited to mechanical actions of rubbing, striking, or breakage caused by loading.
Unknown / not sure / other	Disturbance caused by factors other than listed
Human-caused damage	

8.2.3 Original data

2001:

Damage_Agent_Description	Acres	Hectares	Calibrated ha
Animal	2,348.8000	950.5294	969.8785
Insect	587.2000	237.6324	242.4696
Wind	2,348.8000	950.5294	969.8785
Unknown	1,761.6000	712.8971	727.4089
None	36,584.1711	14,805.1480	15,106.5231
Total forest	43,630.5711	17,656.7363	18,016.1587

8.3 Analysis and processing of national data

8.3.1 Estimation and forecasting

No estimation or forecasting was done. Values reported for 2000 is from data collected in 2001.

8.4 Reclassification into FRA 2005 classes

We combined national classes of unknown, animal, and wind damages into FRA category “other damages”.

8.5 Data for National reporting table T8

FRA-2005 Categories	Average annual area affected (1000 hectares)			
	Forests		Other wooded land	
	1990	2000	1990	2000
Disturbance by fire	NDA	0	NDA	NDA
Disturbance by insects	NDA	0.0242	NDA	NDA
Disturbance by diseases	NDA	0	NDA	NDA
Other disturbance	NDA	2.667	NDA	NDA

8.6 Comments to National reporting table T8

Disturbance codes require "significant threshold" damage, which implies mortality and/or damage to 25 percent of all trees in a stand or 50 percent of an individual species' count. Additionally, some disturbances affect forests but initially may not affect tree growth or health (e.g., grazing, browsing, flooding, etc.). In these cases, a disturbance should be coded when at least 25 percent of the soil surface or understory vegetation has been affected.

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
World Conservation Monitoring Centre 1998. <i>Intsia bijuga</i> . In: IUCN 2004. 2004 IUCN Red List of Threatened	M	Endangered tree species	1998	

9.2.2 Classification and definitions

No national classification exists.

9.2.3 Original data

None.

9.3 Data for National reporting table T9

FRA 2005 Categories	Number of species (year 2000)
Native tree species	NDA
Critically endangered tree species	0
Endangered tree species	0
Vulnerable tree species	1

9.4 Comments to National reporting table T9

Intsia bijuga was the only tree species listed by IUCN for American Samoa.

10 Table T10 – Growing stock composition

10.1 FRA 2005 Categories and definitions

List of species names (scientific and common names) of the ten most common species.

10.2 National data

10.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Donnegan, J. A., S. S. Mann, S. L. Butler, and B. A. Hiserote. 2004. American Samoa's Forest Resources, 2001. Resource Bulletin PNW-RB-244, USDA Forest Service, Pacific Northwest Research Station, Portland, OR.	M	Species volume	2001	Small sample sizes at the species level may correspond to high standard errors.
Cole, T. G., C. D. Whitesell, W. A. Whistler, N. McKay, and A. H. Ambacher. 1988. Vegetation survey and forest inventory, American Samoa. Resour. Bull. PSW-RB-25, USDA Forest Service, Berkeley, CA.	M	Timberland species volume	1986	Small sample sizes at the species level may correspond to high standard errors.

10.2.2 Original data

Net timberland volume by species, American Samoa, 1985 ^a

Species	Common name	Net volume
		<i>Cubic feet</i>
<i>Aglaia samoensis</i>	laga'ali	440,400
<i>Alphitonia zizyphoides</i>	toi	195,993
<i>Alstonia</i> spp.	—	235,690
<i>Arytera</i> spp.	lau'lili'i	165,953
<i>Barringtonia samoensis</i>	falaga	249,787
<i>Bischofia javanica</i>	'o'a	590,180
<i>Calophyllum samoense</i>	tamanu	3,493,340
<i>Canaga odorata</i>	moso'oi	146,573
<i>Cerbera manghas</i>	leva	446,289
<i>Cinnamomum</i> spp.	ochod	129,611
<i>Cocos nucifera</i>	niu	409,406
<i>Colubrina asiatica</i> (L.) Brongn.	fisoa	235,441
<i>Cordia subcordata</i>	tauanave	271,251
<i>Cyathea</i> spp.	olioli	116,711
<i>Diospyros samoensis</i>	'au'auli	1,400,345

<i>Dysoxylum huntii</i> Merr.	maota mea	706,540
<i>Dysoxylum maota</i>	maota	742,893
<i>Dysoxylum samoense</i>	mamala	316,362
<i>Erythrina variegata</i>	gatae	142,945
<i>Eugenia</i> spp.	—	201,584
<i>Ficus</i> spp.	mati	129,598
<i>Flacourtia rukam</i>	filimoto	1,006,583
<i>Garuga floribunda</i> Decne.	—	81,713
<i>Gironniera celtidifolia</i> Gaudich.	lau'nini'i	371,115
<i>Glochidion ramiflorum</i>	mamase	333,752
<i>Guettarda speciosa</i>	belau	146,966
<i>Hibiscus tiliaceus</i>	fau	1,084,986
<i>Inocarpus fagifer</i>	ifi	1,220,209
<i>Kleinhovia hospita</i>	fu'afu'a	245,938
<i>Litsea samoensis</i>	papaono	297,593
<i>Mangifera indica</i>	mago	688,846
<i>Myristica</i> spp.	'atone	4,951,721
<i>Neonauclea forsteri</i>	afa	242,893
<i>Pimelodeudron</i> spp.	—	208,887
<i>Planchonella</i> spp.	mamalava	302,166
<i>Planchonella torricellensis</i>	mamalava	1,830,792
<i>Psychotria</i> spp.	matalafi	374,340
<i>Rhus taitensis</i>	tavai	5,306,192
<i>Syzygium inophylloides</i>	asi	769,298
<i>Terminalia richii</i>	malili	1,582,771
<i>Trichospermum richii</i> (Gray) Seem.	elsau	63,461
Unknown	—	17,813
Total		31,894,925

^a Data recompiled from Cole et al. (1988) correcting algorithm error that underestimated volume (Donnegan et al. 2004).

Estimated gross forest land volume of all live trees by species, 2001

Scientific name	Cubic feet
<i>Adenanthera pavonina</i>	214,306
<i>Aglaia samoensis</i>	1,552,261
<i>Alphitonia zizyphoides</i>	1,103,850
<i>Artocarpus altilis</i>	670,283
<i>Barringtonia samoensis</i>	728,379
<i>Bischofia javanica</i>	2,451,817
<i>Buchanania merrillii</i>	647,312
<i>Calophyllum neo-ebudicum</i>	138,768
<i>Cananga odorata</i>	3,785,886
<i>Canarium ovatum</i>	311,981
<i>Canarium vitiense</i>	1,010,265
<i>Cassia fistula</i>	2,170,552
<i>Castilla elastica</i>	268,320
<i>Cocos nucifera</i>	7,809,286
<i>Cyathea lunulata</i>	1,983,343
<i>Cyathea</i> spp.	204,410
<i>Diospyros samoensis</i>	434,261
<i>Dysoxylum maota</i>	10,120,702
<i>Dysoxylum samoense</i>	39,925
<i>Elaeocarpus ulianus</i>	2,113,047
<i>Erythrina fusca</i>	655,668

<i>Erythrina variegata</i>	48,538
<i>Ficus obliqua</i>	130,280
<i>Ficus scabra</i>	180,070
<i>Flacourtia rukam</i>	264,123
<i>Hernandia nymphaeifolia</i>	743,757
<i>Hibiscus tiliaceus</i>	4,774,262
<i>Inocarpus fagifer</i>	1,283,409
<i>Kleinhovia hospita</i>	430,864
<i>Macaranga grayana</i>	40,388
<i>Macaranga harveyana</i>	1,235,017
<i>Mangifera indica</i>	77,300
<i>Morinda citrifolia</i>	137,619
<i>Myristica fatua</i>	5,216,492
<i>Neisosperma oppositifolia</i>	43,268
<i>Neonauclea forsteri</i>	2,192,181
<i>Omalanthus nutans</i>	269,468
<i>Pipturus argenteus</i>	202,683
<i>Pisonia grandis</i>	28,838
<i>Planchonella garberi</i>	413,197
<i>Planchonella torricellensis</i>	475,654
<i>Rhizophora mangle</i>	1,703,692
<i>Rhus taitensis</i>	7,318,298
<i>Scaevola taccada</i>	46,070
<i>Sterculia fanaiho</i>	44,372
<i>Syzygium inophylloides</i>	947,784
<i>Syzygium samarangense</i>	37,186
Total	66,699,430

10.3 Analysis and processing of national data

10.3.1 Calibration

Numbers from 2001 inventory were converted to metric units:

Million cubic meters volume = Cubic foot volume * 0.02831684659/1,000,000

10.3.2 Estimation and forecasting

Data for table 10.4 represents 2001 inventory. No estimation or forecasting was performed owing to species' volume being measured on timberland only in 1986 and all forest land in 2001. The two datasets are incompatible because different species are expected in areas of differing productivity.

10.4 Data for National reporting table T10

FRA 2005 Categories / Species name (Scientific name and common name)	Growing Stock in Forests (million cubic meters)	
	1990	2000
<i>Dysoxylum maota</i>	NDA	0.2866
<i>Cocos nucifera</i>	NDA	0.2211
<i>Rhus taitensis</i>	NDA	0.2072
<i>Myristica fatua</i>	NDA	0.1477
<i>Hibiscus tiliaceus</i>	NDA	0.1350
<i>Cananga odorata</i>	NDA	0.1072
<i>Bischofia javanica</i>	NDA	0.0694

<i>Neonauclea forsteri</i>	NDA	0.0621
<i>Cassia fistula</i>	NDA	0.0615
<i>Elaeocarpus ulianus</i>	NDA	0.0598
Remainder of species	NDA	0.5163
TOTAL	NDA	1.8740

10.5 Comments to National reporting table T10

Prior data (Cole et al. 1986) was collected only for the most productive subset of forest land. The numbers are not comparable with the 2001 data where all forest lands were included in the inventory. Donnegan et al. (2004) revised the numbers in Cole et al. (1986).

1986 timberland (most productive subset of forestland) volume by species:

Species name	Timberland volume (Million cubic meters)
<i>Rhus taitensis</i>	0.1503
<i>Myristica spp.</i>	0.1402
<i>Calophyllum samoense</i>	0.0989
<i>Planchonella torricellensis</i>	0.0518
<i>Terminalia richii</i>	0.0448
<i>Diospyros samoensis</i>	0.0397
<i>Inocarpus fagifer</i>	0.0346
<i>Hibiscus tiliaceus</i>	0.0307
<i>Flacourtia rukam</i>	0.0285
<i>Syzygium inophylloides</i>	0.0218
Remainder of species	0.2619
TOTAL	0.9032

11 Table T11 – Wood removal

No quantitative data available.

12 Table T12 – Value of wood removal

No quantitative data available.

13 Table T13 – Non-wood forest product removal

No quantitative data available.

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

No quantitative data available.

15 Table T15 – Employment in forestry

No quantitative data available.