



**Forestry Department**

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

**GLOBAL FOREST RESOURCES  
ASSESSMENT**

**COUNTRY REPORTS**

**SAMOA**

FRA2005/096  
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## The Forest Resources Assessment Programme

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

FAO, at the request of its member countries, regularly monitors the world's forests and their management and uses through the Forest Resources Assessment Programme. This country report forms part of the Global Forest Resources Assessment 2005 (FRA 2005), which is the most comprehensive assessment to date. More than 800 people have been involved, including 172 national correspondents and their colleagues, an Advisory Group, international experts, FAO staff, consultants and volunteers. Information has been collated from 229 countries and territories for three points in time: 1990, 2000 and 2005.

The reporting framework for FRA 2005 is based on the thematic elements of sustainable forest management acknowledged in intergovernmental forest-related fora and includes more than 40 variables related to the extent, condition, uses and values of forest resources. More information on the FRA 2005 process and the results - including all the country reports - is available on the FRA 2005 Web site ([www.fao.org/forestry/fra2005](http://www.fao.org/forestry/fra2005)).

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

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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                                               |
|----------------------------------------------------------------------------------------------------------------------------|-----------------|-----------------|---------|-------------------------------------------------------------------|
| SamFRIS <sup>1</sup> 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    |                                                                   |

#### 1.2.2 Classification and definitions

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

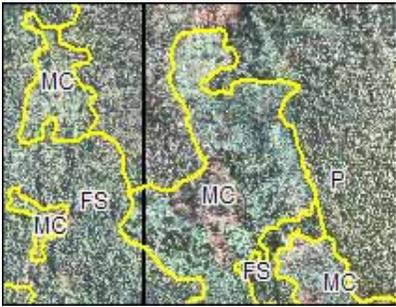
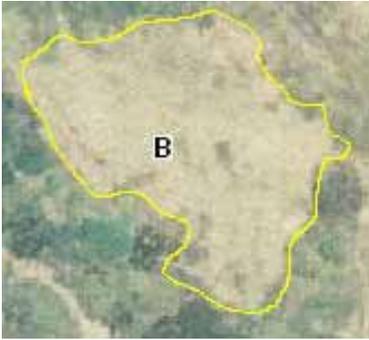
<sup>1</sup> Samoa Forest Resource Information System

| Major Class                 | Sub Class                                                                                                                | Description                                                                                                                                                                                                                                                                                                                                                                            | Photo Sample                                                                         |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| <b>FOREST</b>               |                                                                                                                          | Land with a tree crown cover (or stocking level) of more than <b>10%</b> and a minimum area size of <b>1 hectare</b> . Includes man made plantation forests, mangrove forests and other natural forests of various canopy densities.                                                                                                                                                   |                                                                                      |
| <b>Natural Forest</b>       |                                                                                                                          | Forests that have established naturally, ie not planted by man                                                                                                                                                                                                                                                                                                                         |                                                                                      |
| Mangrove Forest<br><b>M</b> | -                                                                                                                        | Low-lying coastal areas inundated by saline or brackish water and containing mangrove vegetation, dominated by either <i>Brugguiera</i> or <i>Rhizophora</i> tree spp.                                                                                                                                                                                                                 |   |
| Closed Forest<br><b>FC</b>  | <ul style="list-style-type: none"> <li>- u</li> <li>- lo</li> <li>- c</li> <li>- w</li> <li>- n</li> <li>- sw</li> </ul> | <p>Forest formations with various storeys and total crown coverage of more than <b>65 - 70%</b>. Includes primary forests as well as forests in an advanced status of reconstitution after logging, farming or other natural causes (fire, cyclone, etc.)</p> <p>(apparently) undisturbed<br/>logged over<br/>formerly cultivated<br/>windfall<br/>other natural causes<br/>swampy</p> |  |

| Major Class                              | Sub Class                                                                                                                                                                                                                                                                                                  | Description                                                                                                                                                                                                                                        | Photo Sample                                                                         |
|------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| <p>Medium Dense Forest<br/><b>FM</b></p> | <ul style="list-style-type: none"> <li>- u (apparently) undisturbed</li> <li>- lo logged over</li> <li>- c formerly cultivated</li> <li>- w windfall</li> <li>- n other natural causes</li> <li>- sw swampy</li> <li>- mm Merremia vines</li> <li>- fs presence of secondary spp. (eg Albizzia)</li> </ul> | <p>Medium dense forest formations with discontinuous tree layer with one or more storeys and with a crown coverage of more than <b>40% and less than 65 - 70%</b>.</p>                                                                             |   |
| <p>Open Forest<br/><b>FO</b></p>         | <ul style="list-style-type: none"> <li>- u (apparently) undisturbed</li> <li>- lo logged over</li> <li>- c formerly cultivated</li> <li>- w windfall</li> <li>- n other natural causes</li> <li>- sw swampy</li> <li>- mm Merremia vines</li> <li>- fs presence of secondary spp. (eg Albizzia)</li> </ul> | <p>Forest formations with a discontinuous tree layer but with a crown coverage of <b>at least 10% and less than 40%</b>. Includes highly degraded and depleted forest due to recent logging, farming or natural disasters (storms, fire, etc.)</p> |  |

| Major Class                    | Sub Class                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Description                                                                                                                                                                                                                   | Photo Sample                                                                         |
|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| Secondary Forest<br><b>FS</b>  | <ul style="list-style-type: none"> <li>- <b>alb</b> Albizzia (tamaligi)</li> <li>- <b>lo</b> logged over</li> <li>- <b>c</b> formerly cultivated</li> <li>- <b>w</b> windfall</li> <li>- <b>bl</b> burnt land</li> <li>- <b>n</b> other natural causes</li> <li>- <b>mm</b> Merremia vines</li> <li>- <b>cn</b> presence of scattered coconut trees</li> <li>- <b>mc</b> presence of mixed crops (eg. bananas, taamu, taro, breadfruit etc)</li> <li>- <b>rv</b> presence of remnant vegetation of primary forest species</li> </ul> | <p>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 (<i>Merremia</i> and <i>Mikania</i>).</p> |   |
| Forest Plantation<br><b>FP</b> | <ul style="list-style-type: none"> <li>- <b>x</b></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <p>Man-made forest stands established by planting and/or seeding.</p> <p>'species'</p>                                                                                                                                        |  |
| <b>OTHER WOODED LAND</b>       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 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<br><b>SC</b>      | - f<br>- l<br>- h<br>- tf<br>- v<br>- bl             | Areas with dominance of woody perennial shrubs of less than 5-7m height and without a definite crown.<br><br>ground ferns<br>littoral scrub; native shrubby vegetation occurring on the seaward side of coastal forests; dominated by dwarf shrubs up to 2-3m height<br>hibiscus<br>tree ferns<br>volcanic lava flow<br>burnt land |   |
| <b>OTHER LAND</b>       |                                                      | Land not classified as forest or other wooded landmass defined above. Includes agricultural land, grass land, built-up areas and barren land etc                                                                                                                                                                                   |                                                                                      |
| <b>Agriculture</b>      |                                                      | Land permanently, or temporarily used for agricultural production                                                                                                                                                                                                                                                                  |                                                                                      |
| Plantations<br><b>P</b> | - cn<br>- cn/lp<br>- co<br>- b<br>- cn/mc<br>- cn/fs | Permanent agricultural installations, mostly tree crops or continued / repeated planting of e.g. coconuts or banana (agro-industrial).<br><br>coconut<br>coconut with livestock production<br>coffee / cocoa<br>banana<br>coconut mixed with other crops<br>coconuts overgrown with secondary species                              |  |

| Major Class              | Sub Class                                                                                                                                                             | Description                                                                                                                                                                                                                                                                                                                                                                                                                                          | Photo Sample                                                                         |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| Mixed Crops<br><b>MC</b> | <ul style="list-style-type: none"> <li>- <b>cn</b></li> <li>- <b>cn/fs</b></li> </ul>                                                                                 | <p>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.</p> <p>coconut<br/>coconuts overgrown with secondary species</p>                                                                                               |   |
| <b>Open Land</b>         |                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                      |
| Grass land<br><b>G</b>   | <ul style="list-style-type: none"> <li>- <b>f</b></li> <li>- <b>mw</b></li> <li>- <b>lp</b></li> <li>- <b>mc</b></li> <li>- <b>fs</b></li> <li>- <b>tf</b></li> </ul> | <p>Open land dominated by herbaceous or grassy vegetation but often with scattered trees</p> <p>ground ferns<br/>marsh wetland with predominantly herbaceous vegetation covering flat areas of soil saturated with freshwater (inland craters) or brackish water (coastal marshes).<br/>livestock production<br/>presence of mixed crops (eg. bananas, taamu, taro, breadfruit etc)<br/>presence of secondary species<br/>presence of tree ferns</p> |   |
| Barren land<br><b>B</b>  | <ul style="list-style-type: none"> <li>- <b>ro</b></li> <li>- <b>s</b></li> <li>- <b>q</b></li> <li>- <b>bl</b></li> <li>- <b>v</b></li> </ul>                        | <p>All land lacking any vegetation cover; except for infrastructure and built-up areas.</p> <p>rocky<br/>sandy (incl. beaches)<br/>quarry site<br/>burnt land<br/>volcanic lava flow</p>                                                                                                                                                                                                                                                             |  |

| Major Class                | Sub Class                            | Description                                                                                                                                                                                                                                                              | Photo Sample                                                                         |
|----------------------------|--------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| Built-Up area<br><b>BU</b> | - r<br>- cd<br>- gov<br>- sch<br>- o | All settlement areas, encompasses continuous developments, industrial or commercial built-up areas and scattered isolated houses including gardens and inner-city parks.<br><br>residential<br>commercial development (eg new hotels)<br>governmental<br>school<br>other |   |
| Infrastructure<br><b>I</b> | - wh<br>- sp<br>- ap<br>- lm         | All roads (hard surfaced or loose) and infrastructure related facilities (e.g. airports / airstrips, ports, wharves, sports compounds etc.)<br><br>wharf<br>Sports compound<br>airport<br>logging mill                                                                   |  |
| Inland Water               |                                      | Areas occupied by major rivers, lakes, reservoirs and swamps                                                                                                                                                                                                             |                                                                                      |
| Rivers<br><b>R</b>         |                                      | Major rivers and creeks                                                                                                                                                                                                                                                  |                                                                                      |
| Lakes<br><b>L</b>          | - wr<br>- lg                         | Lakes and waterbodies<br>water reservoirs<br>lagoons                                                                                                                                                                                                                     |                                                                                      |

| Major Class   | Sub Class | Description                                                                                                                                                        | Photo Sample                                                                        |
|---------------|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Wetland<br>WL | - mw      | An area of wetland with a mixture of trees and herbaceous plants<br><br>marsh wetland (predominantly herbaceous vegetation rather than trees (coastal or montane)) |  |
| Shadow<br>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)                |  |

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

### 1.2.3 Original data

Most recent data: Based on the 1999 Aerial Photo Interpretation

| Main Land Cover Type | Islands      |            |               |              |              |               |                  |                  |                  |                            |
|----------------------|--------------|------------|---------------|--------------|--------------|---------------|------------------|------------------|------------------|----------------------------|
|                      | Apolima      | Fanuatapu  | Manono        | Namua        | Nuulua       | Nuutele       | Savaai           | 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                       |
| <b>Grand Total</b>   | <b>97.39</b> | <b>5.7</b> | <b>288.15</b> | <b>14.59</b> | <b>20.95</b> | <b>101.14</b> | <b>170879.41</b> | <b>112776.93</b> | <b>284184.26</b> | <b>100.00</b>              |

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 | Savaai | 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 FAO STAT figures

| Source                    | Total area (1 000 ha) |
|---------------------------|-----------------------|
| National data             | 284                   |
| FAOSTAT                   | 284                   |
| <i>Calibration factor</i> |                       |

#### 1.3.2 Estimation and forecasting

As explained in section 1.2.4, 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.

#### 1.4 Reclassification into FRA 2005 classes

| National classes     | FRA 2005 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%         |       |

#### 1.5 Data for National reporting table T1

| FRA 2005 Categories         | Area (1000 hectares) |            |            |
|-----------------------------|----------------------|------------|------------|
|                             | 1990                 | 2000       | 2005       |
| Forest                      | 130                  | 171        | 171        |
| Other wooded land           | ..                   | 22         | 22         |
| Other land <sup>2</sup>     | 154                  | 90         | 90         |
| ...of which with tree cover | ..                   | 63         | 63         |
| Inland water bodies         | 1                    | 1          | 1          |
| <b>TOTAL</b>                | <b>284</b>           | <b>284</b> | <b>284</b> |

#### Explanatory notes:

- 1) 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.
- 2) For the year 2000 and 2005, 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.
- 3) For 1990 data, other land with tree cover is included in other land class.

## 1.6 Comments to National reporting table T1

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 2005 (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 2005 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.

## 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 |
|---------------------------------------------------|-----------------|-------------|------------|---------------------|
| SamFRIS Database, Samoa Forestry Division, (2004) | H               |             | 1999, 2003 |                     |

#### 2.2.2 Classification and definitions

| National classes         | 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 <sup>1</sup> 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<br>(1000 hectares) | Percentage of total<br>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<br>Leases <sup>1</sup> | 4.8                            | 1.7                              |
| WESTEC Land                                              | 6.7                            | 2.3                              |
| State Forest <sup>2</sup>                                | 2.6                            | 1.0                              |
| Non-forest land <sup>3</sup>                             | 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. The total land area corresponds with FAO STAT figures

### 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.

## 2.4 Reclassification into FRA 2005 classes

| National classes         | FRA 2005 Categories<br>Forest areas |                  |                 |
|--------------------------|-------------------------------------|------------------|-----------------|
|                          | Private ownership                   | Public ownership | Other ownership |
| Customary Land           |                                     | 100%             |                 |
| State Land               |                                     | 100%             |                 |
| Private Freehold Land    | 100%                                |                  |                 |
| WESTEC <sup>1</sup> Land |                                     | 100%             |                 |

|                   | Public land | Private land | Other ownership |
|-------------------|-------------|--------------|-----------------|
| Other wooded land | 90%         | 10%          |                 |
|                   |             |              |                 |

## 2.5 Data for National reporting table T2

| FRA 2005 Categories | Area (1000 hectares) |            |                   |           |
|---------------------|----------------------|------------|-------------------|-----------|
|                     | Forest               |            | Other wooded land |           |
|                     | 1990                 | 2000       | 1990              | 2000      |
| Private ownership   | NA <sup>1</sup>      | 3.2        | NA                | 2.2       |
| Public ownership    | NA                   | 167.3      | NA                | 19.8      |
| Other ownership     | NA                   |            | NA                |           |
| <b>TOTAL</b>        |                      | <b>171</b> |                   | <b>22</b> |

1) There is some data available but due to the incomplete analysis and recording of some of the land tenure categories, including field checks, utilizing such data then to present forest ownership in 1990 would be misleading.

## 2.6 Comments to National reporting table T2

Data for Table 2 can only report on figures for the year 2000 using the SamFRIS database. As mentioned in preceding sections and explanatory notes, there is little choice in reporting on 1990 as the data available are incomplete, incomparable and unchecked. Presenting such data would only misconstrue further information on ownership of forests and other wooded land in Samoa. From Table 2, it can be seen that what falls under public ownership constitute around 97% of the total forest area and 59% of total land area.

### 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

##### 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 <sup>1</sup> 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.                                      |

Explanatory notes:

1) Merchantable or harvestable forests in Samoa must at least have 29m<sup>3</sup> 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 interpretation with 2004 ground truthing. Source: SamFRIS 2004)**

| Sum of AREA                    |               | ISLAND_NAME  |              |             |              |              |                 |                 | Grand Total      | Percent of Samoa |
|--------------------------------|---------------|--------------|--------------|-------------|--------------|--------------|-----------------|-----------------|------------------|------------------|
| FOREST_STATUS                  | MAIN_VEG_TYPE | Apolima      | Manono       | Namua       | Nuulua       | Nuutele      | Savaai          | Upolu           |                  |                  |
| 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                |                  |
| <b>production forest Total</b> |               | <b>23.93</b> | <b>53.76</b> |             |              |              | <b>58344.71</b> | <b>28846.47</b> | <b>87268.87</b>  | <b>30.71</b>     |
| 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          |                  |                  |
| <b>protection forest Total</b> |               |              |              | <b>9.27</b> | <b>13.77</b> | <b>95.45</b> | <b>59708.69</b> | <b>23976.91</b> | <b>83804.09</b>  | <b>29.49</b>     |
| <b>Grand Total</b>             |               | <b>23.93</b> | <b>53.76</b> | <b>9.27</b> | <b>13.77</b> | <b>95.45</b> | <b>118053.4</b> | <b>52823.38</b> | <b>171072.96</b> | <b>60.20</b>     |

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          | <i>Protection Forest</i> | 83804.09  | 29.49            |
|                 | <i>Production Forest</i> | 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. The total land area corresponds with FAO STAT figures

#### 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

### 3.4 Reclassification into FRA 2005 classes

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

|                              |                   |    |                  |
|------------------------------|-------------------|----|------------------|
| <b>Total production area</b> | 87.2 thousand ha. |    |                  |
| ... of which forest          | 90%               | or | 78.5 thousand ha |
| ... of which OWL             | 10%               | or | 8.7 thousand ha  |
| <b>Total protection area</b> | 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%         |
| <b>Total</b>                 | <b>100%</b>      | <b>100%</b> | <b>100%</b>     | <b>100%</b> |

The reclassification percentages assigned here are based on expert knowledge

|                              | Production areas |            | Protected areas |             |
|------------------------------|------------------|------------|-----------------|-------------|
|                              | Forests          | OWL        | Forests         | OWL         |
| <b>Area (1000 ha)</b>        | <b>78.5</b>      | <b>8.7</b> | <b>71.2</b>     | <b>12.6</b> |
| 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         |
| <b>Total</b>                 | <b>78.5</b>      | <b>8.7</b> | <b>71.2</b>     | <b>12.6</b> |

#### Analysis of forest areas without a prescribed designated function

Total designated forest area 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 <sup>1</sup> | 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            |
| <b>Total</b>                 | <b>100%</b>                      | <b>21.3</b>    |

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

#### Analysis of other wooded land areas without a prescribed designated function

Total designated other wooded land is 21.3 thousand ha (8.7 + 12.6)

Other wooded land without prescribed designated area is 0.9 thousand ha. (22.2 thousand ha total forest area minus 21.3 thousand ha.)

#### Assessment/classification of other wooded land areas without any prescribed designated function

| Primary designated function  | Assessed percentage <sup>1</sup> | Area (1000 ha) |
|------------------------------|----------------------------------|----------------|
| Production                   | 20                               | 0.2            |
| Protection of soil & water   | 20                               | 0.2            |
| Conservation of biodiversity | 0                                | 0              |
| Social services              | 0                                | 0              |
| Multiple purpose             | 40                               | 0.3            |
| No or unknown designation    | 20                               | 0.2            |
| <b>Total</b>                 | <b>100%</b>                      | <b>0.9</b>     |

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

| Forests                     |                      |                          |            | OWL                  |                          |            |
|-----------------------------|----------------------|--------------------------|------------|----------------------|--------------------------|------------|
| Primary function            | Leg/Admin designated | Not leg/Admin designated | Total area | Leg/Admin designated | Not leg/Admin designated | Total area |
| Production                  | 78.5                 | 2.1                      | 80.6       | 8.7                  | 0.2                      | 8.9        |
| Protection of soil & water  | 28.5                 | 6.4                      | 34.9       | 6.3                  | 0.2                      | 6.5        |
| Conservation & biodiversity | 28.5                 | 0                        | 28.5       | 1.3                  | 0                        | 1.3        |
| Social services             | 7.1                  | 0                        | 7.1        | 1.3                  | 0                        | 1.3        |
| Multiple purpose            |                      | 8.5                      | 8.5        | 1.3                  | 0.3                      | 1.6        |
| No/unknown designated       | 7.1                  | 4.3                      | 11.4       | 2.4                  | 0.2                      | 2.6        |
| <b>Total</b>                | <b>149.7</b>         | <b>21.3</b>              | <b>171</b> | <b>21.3</b>          | <b>0.9</b>               | <b>22</b>  |

### Assessing total area with function

#### Forests

| Primary function<br>Area (1000 ha) |      | Percentage of area serving other functions <sup>1</sup> |                            |                              |                 |
|------------------------------------|------|---------------------------------------------------------|----------------------------|------------------------------|-----------------|
|                                    |      | Production                                              | Protection of soil & water | Conservation of biodiversity | Social services |
| Production                         | 80.6 | 100%                                                    | 20%                        | 30%                          | 40%             |
| Protection of soil & water         | 34.9 |                                                         | 100%                       | 50%                          | 20%             |
| Conservation of biodiversity       | 28.5 |                                                         |                            | 100%                         |                 |
| Social services                    | 7.1  |                                                         |                            | 20%                          | 100%            |
| Multiple purpose                   | 8.5  | 100%                                                    | 100%                       | 40%                          | 50%             |

1) Percentage of area serving other functions is made based on expert knowledge

#### Other wood land

| Primary function<br>Area (1000 ha) |     | Percentage of area serving other functions <sup>1</sup> |                            |                              |                 |
|------------------------------------|-----|---------------------------------------------------------|----------------------------|------------------------------|-----------------|
|                                    |     | Production                                              | Protection of soil & water | Conservation of biodiversity | Social services |
| Production                         | 8.9 | 100%                                                    | 10%                        | 10%                          | 40%             |
| Protection of soil & water         | 6.5 |                                                         | 100%                       | 30%                          | 20%             |
| Conservation of biodiversity       | 1.3 |                                                         | 10%                        | 100%                         | 10%             |
| Social services                    | 1.3 | 20%                                                     |                            |                              | 100%            |
| Multiple purpose                   | 1.6 | 100%                                                    | 100%                       | 30%                          | 10%             |

1) Percentage of area serving other functions is made based on expert knowledge

### 3.5 Data for National reporting table T3

Data for National reporting table T3

| FRA 2005 Categories /<br>Designated function | Area (1000 hectares) |            |            |                          |                  |                  |
|----------------------------------------------|----------------------|------------|------------|--------------------------|------------------|------------------|
|                                              | Primary function     |            |            | Total area with function |                  |                  |
|                                              | 1990                 | 2000       | 2005       | 1990                     | 2000             | 2005             |
| <b>Forest</b>                                |                      |            |            |                          |                  |                  |
| Production                                   | NA <sup>1</sup>      | 80.6       | 80.6       |                          | 89.1             | 89.1             |
| Protection of soil and water                 | NA                   | 34.9       | 34.9       |                          | 59.5             | 59.5             |
| Conservation of biodiversity                 | NA                   | 28.5       | 28.5       |                          | 75.0             | 75.0             |
| Social services                              | NA                   | 7.1        | 7.1        |                          | 50.6             | 50.6             |
| Multiple purpose                             | NA                   | 8.5        | 8.5        | not appl.                | not appl.        | not appl.        |
| No or unknown function                       | NA                   | 11.4       | 11.4       | not appl.                | not appl.        | not appl.        |
| <b>Total - Forest</b>                        |                      | <b>171</b> | <b>171</b> | <b>not appl.</b>         | <b>not appl.</b> | <b>not appl.</b> |
| <b>Other wooded land</b>                     |                      |            |            |                          |                  |                  |
| Production                                   | NA                   | 8.9        | 8.9        |                          | 10.8             | 10.8             |
| Protection of soil and water                 | NA                   | 6.5        | 6.5        |                          | 9.1              | 9.1              |
| Conservation of biodiversity                 | NA                   | 1.3        | 1.3        |                          | 4.6              | 4.6              |
| Social services                              | NA                   | 1.3        | 1.3        |                          | 6.5              | 6.5              |
| Multiple purpose                             | NA                   | 1.6        | 1.6        | not appl.                | not appl.        | not appl.        |
| No or unknown function                       | NA                   | 2.6        | 2.6        | not appl.                | not appl.        | not appl.        |
| <b>Total – Other wooded land</b>             |                      | <b>22</b>  | <b>22</b>  | <b>not appl.</b>         | <b>not appl.</b> | <b>not appl.</b> |

1) For 1990, there is no data available.

### 3.6 Comments to National reporting table T3

For Table 3, Samoa can only report on years 2000 and 2005. 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 2005 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 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 – Characteristics of Forest and Other wooded land

### 4.1 FRA 2005 Categories and definitions

| Category              | Definition                                                                                                                                                                     |
|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Primary               | Forest / Other wooded land of native species, where there are no clearly visible indications of human activities and the ecological processes are not significantly disturbed. |
| Modified natural      | Forest / Other wooded land of naturally regenerated native species where there are clearly visible indications of human activities.                                            |
| Semi-natural          | Forest / Other wooded land of native species, established through planting, seeding or assisted natural regeneration.                                                          |
| Productive plantation | Forest / Other wooded land of introduced species, and in some cases native species, established through planting or seeding mainly for production of wood or non wood goods.   |
| Protective plantation | Forest / Other wooded land of native or introduced species, established through planting or seeding mainly for provision of services.                                          |

### 4.2 National data

#### 4.2.1 Data sources

##### Data source

| 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 <sup>1</sup>                                                                                                                                                                                                                                 |
|---------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Close Forests (FC)        | Forest formations with various storeys and total crown coverage of more than <b>65 - 70%</b> . 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 <b>40% and less than 65 - 70%</b> .                                                                                        |
| Open Forests (FO)         | Forest formations with a discontinuous tree layer but with a crown coverage of <b>at least 10% and less than 40%</b> . 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 ( <i>Merremia</i> and <i>Mikania</i> ).                                |
| 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 <i>Bruguiera</i> or <i>Rhizophora</i> tree spp.                                                                                   |
| Wetland (WL)              | An area of wetland with a mixture of trees and herbaceous plants                                                                                                                                                                                        |
| Scrub (SC)                | Land with a tree crown cover (or stocking level) of less than 10%. Includes scrub and woodland. Areas with dominance of woody perennial shrubs of less than 5-7m height and without a definite crown.                                                   |

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            |
| Scrub (SC)                | 22.0           |
| Total                     | 193            |

## 4.3 Analysis and processing of national data

### 4.3.1 Calibration

Not needed. The total land area corresponds with FAO STAT figures

### 4.3.2 Estimation and forecasting

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

### 4.4 Reclassification into FRA 2005 classes

| National classes | FRA 2005 Categories |                   |
|------------------|---------------------|-------------------|
|                  | Forests             | Other wooded land |
| FC               | 100%                |                   |
| FM               | 100%                |                   |
| FO               | 100%                |                   |
| FS               | 100%                |                   |
| FP               | 100%                |                   |
| M                | 100%                |                   |
| WL               | 100%                |                   |
| SC               |                     | 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%                   |
| Other wooded land |                     |                  |              |                       |                       |
| National classes  | Primary             | Modified natural | Semi-natural | Productive plantation | Protective plantation |
| SC                |                     | 50%              | 20%          | 20%                   | 10%                   |

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                  |
| Other wooded land |                     |                  |              |                       |                       |
| National classes  | Primary             | Modified natural | Semi-natural | Productive plantation | Protective plantation |
| SC                |                     | 11.1             | 4.4          | 4.4                   | 2.2                   |
| Total             |                     | 11.1             | 4.4          | 4.4                   | 2.2                   |

#### 4.5 Data for National reporting table T4

| FRA 2005 Categories   | Area (1000 hectares) |            |            |                   |           |           |
|-----------------------|----------------------|------------|------------|-------------------|-----------|-----------|
|                       | Forest               |            |            | Other wooded land |           |           |
|                       | 1990                 | 2000       | 2005       | 1990              | 2000      | 2005      |
| Primary               | NA                   | 0.02       | 0.02       | NA                | NA        | NA        |
| Modified natural      | NA                   | 110.0      | 110.0      | NA                | 11.0      | 11.0      |
| Semi-natural          | NA                   | 28.6       | 28.6       | NA                | 4.4       | 4.4       |
| Productive plantation | NA                   | 21.3       | 21.3       | NA                | 4.4       | 4.4       |
| Protective plantation | NA                   | 10.8       | 10.8       | NA                | 2.2       | 2.2       |
| <b>TOTAL</b>          | NA                   | <b>171</b> | <b>171</b> | NA                | <b>22</b> | <b>22</b> |

#### 4.6 Comments to National reporting table T4

The characteristic of Samoa's forest and other wooded land can only be reported as in previous tables, for the years 2000 and 2005. As previously mentioned and explained in the other sections, data for 1990 is insufficient and incomplete, thus cannot be used to report on the areas of the different categories for that year. For 2005, again based on firm expert knowledge of the local forestry situation, it is anticipated that 2005 figures will not change drastically, or if changed, would be insignificant hence the figures will be similar to 2000.

**5 Table T5 – Growing stock**

Samoa has some figures/data on the growing stock based on recent forestry inventory but at this stage due to the lack of an accepted volume equation, no data on growing stock can be provided.

**6 Table T6 – Biomass stock**

Can not be provided as there is no data.

**7 Table T7 – Carbon stock**

Cannot be provided given no data.

**8 Table T8 – Disturbances affecting health and vitality**

Cannot be provided due to lack of data.

**9 Table T9 – Diversity of tree species**

Insufficient and no readily available data.

**10 Table T10 – Growing stock composition**

Insufficient data and lack of complete data per tree species etc.

## 11 Table T11 – Wood removal

### 11.1 FRA 2005 Categories and definitions

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

### 11.2 National data

#### 11.2.1 Data sources

| References to sources of information | Quality (H/M/L) | Variable(s) | Year(s)               | Additional comments                                                                        |
|--------------------------------------|-----------------|-------------|-----------------------|--------------------------------------------------------------------------------------------|
| Samoa Forestry Division              | H               |             | 1991<br>up to<br>2004 | Data is supplied by the Unit responsible for monitoring and controlling logging operations |

#### 11.2.2 Classification and definitions

| National class    | Definition                                                                                                                |
|-------------------|---------------------------------------------------------------------------------------------------------------------------|
| Round log removal | Logs of different commercial species, used for timber processing. Logs are harvested over-bark and must be over 60cm dbh. |
| Fuelwood          | Wood used for cooking and for other general energy/heat requirements                                                      |

Explanatory note:

Samoa only records round wood (logs) harvested by timber companies. No records are kept of fuelwood or other wood removals. However, this does not mean that Samoa has not been using fuelwood or harvesting other wood, for example posts for local house construction. Fuelwood and other wood are harvested at subsistence level and are basically for private use, by local communities.

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

### 11.2.3 Original data

| Year | Total volume (1000cu.m) |                   |
|------|-------------------------|-------------------|
|      | Natural forests         | Other wooded land |
| 1991 | 9.5                     | NA <sup>1</sup>   |
| 1992 | 31.6                    | NA                |
| 1993 | 26.7                    | NA                |
| 1994 | 23.3                    | NA                |
| 1995 | 16.3                    | NA                |
| 1996 | 17.9                    | NA                |
| 1997 | 19.3                    | NA                |
| 1998 | 17.3                    | NA                |
| 1999 | 15.2                    | NA                |
| 2000 | 14.9                    | NA                |
| 2001 | 17.7                    | NA                |
| 2002 | 18.2                    | NA                |
| 2003 | 13.0                    | NA                |
| 2004 | 9.7                     | NA                |

1) No data available for wood harvested in other wooded land. Other wooded land in Samoa are generally poor in wood quantity and quality thus are not assign for commercial logging. However some harvesting of round wood occur for provision of building materials such as house and fence posts but are not formally recorded.

## 11.3 Analysis and processing of national data

### 11.3.1 Estimation and forecasting

The data presented is supplied by the Samoa Forestry Division based on submissions of monthly records of logs harvested by the licensed timber companies. All logging operations are based in Savaii, the only island with remaining merchantable forests and the country's largest island. Most of the round wood or logs are from the natural forests. Wood from forest plantations are yet to be harvested given the young age of the plantations.

## 11.4 Reclassification into FRA 2005 classes

Not necessary. For Samoa industrious round wood basically mean round logs. Fuelwood is harvested at the subsistence level, mainly used by local communities for cooking and preparation of traditional feasts. Fuelwood is collected in both forest and other wooded land but not reported on for official records.

### 11.5 Data for National reporting table T11

| FRA 2005 Categories      | Volume in 1000 cubic meters of round wood over bark |             |             |                   |      |      |
|--------------------------|-----------------------------------------------------|-------------|-------------|-------------------|------|------|
|                          | Forest                                              |             |             | Other wooded land |      |      |
|                          | 1990                                                | 2000        | 2005        | 1990              | 2000 | 2005 |
| Industrial roundwood     | 7.8                                                 | 14.9        | 10.8        | NA                | NA   | NA   |
| Woodfuel                 | NA                                                  | NA          | NA          | NA                | NA   | NA   |
| <b>TOTAL for Country</b> | <b>7.8</b>                                          | <b>14.9</b> | <b>10.8</b> | NA                | NA   | NA   |

### 11.6 Comments to National reporting table T11

Samoa can only report on round wood or logs harvested by timber companies. As explained in the various sections above, some harvesting of round wood and fuelwood do occur in other wooded land but are not recorded on a formal basis.

## 12 Table T12 – Value of wood removal

### 12.1 FRA 2005 Categories and definitions

| Category                         | Definition                                                                                                               |
|----------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| Value of industrial wood removal | Value of the wood removed for production of goods and services other than energy production (woodfuel).                  |
| Value of woodfuel removal        | Value of the wood removed for energy production purposes, regardless whether for industrial, commercial or domestic use. |

### 12.2 National data

#### 12.2.1 Data sources

| References to sources of information | Quality (H/M/L) | Variable(s) | Year(s)         | Additional comments                                                                        |
|--------------------------------------|-----------------|-------------|-----------------|--------------------------------------------------------------------------------------------|
| Samoa Forestry Division              | H               |             | 1991 up to 2004 | Data is supplied by the Unit responsible for monitoring and controlling logging operations |

#### 12.2.2 Classification and definitions

No formal classification or definition.

#### 12.2.3 Original data

| Year | Value in US \$ |
|------|----------------|
| 1991 | 28,500         |
| 1992 | 94,800         |
| 1993 | 80,100         |
| 1994 | 69,900         |
| 1995 | 48,900         |
| 1996 | 53,700         |
| 1997 | 57,900         |
| 1998 | 51,900         |
| 1999 | 45,600         |
| 2000 | 44,700         |
| 2001 | 53,100         |
| 2002 | 54,600         |
| 2003 | 39,000         |
| 2004 | 29,100         |

### 12.3 Analysis and processing of national data

#### 12.3.1 Estimation and forecasting

The estimation of the value of round wood is just for logs harvested from forests. The value is calculated using a forestry fee charged by the Government of Samoa on a per cubic metres basis. The charging fee per cubic metre is US \$3.00 and applies to all tree species.

## 12.4 Reclassification into FRA 2005 classes

Not necessary or needed.

## 12.5 Data for National reporting table T12

| FRA 2005 Categories      | Value of roundwood removal (1000 USD) |             |             |                   |      |      |
|--------------------------|---------------------------------------|-------------|-------------|-------------------|------|------|
|                          | Forest                                |             |             | Other wooded land |      |      |
|                          | 1990                                  | 2000        | 2005        | 1990              | 2000 | 2005 |
| Industrial roundwood     | 23.4                                  | 44.7        | 32.4        | NA <sup>1</sup>   | NA   | NA   |
| Woodfuel                 | NA                                    | NA          | NA          | NA                | NA   | NA   |
| <b>TOTAL for Country</b> | <b>23.4</b>                           | <b>44.7</b> | <b>32.4</b> | NA                | NA   | NA   |

1) No data available for other wooded land given no harvesting in that category.

## 12.6 Comments to National reporting table T12

Samoa can only report on value of industrial round wood which in the Samoa situation correspond to round logs harvested. There is no harvesting in other wooded land. There is also no data on value of wood fuel given the non-recording of fuelwood harvested in the country.

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

No data available.

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

No data available.

## 15 Table T15 – Employment in forestry

### 15.1 FRA 2005 Categories and definitions

| Category                        | Definition                                                                                                                         |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| Primary production of goods     | Employment in activities related to primary production of goods, like industrial roundwood, woodfuel and non-wood forest products. |
| Provision of services           | Employment in activities directly related to services from forests and woodlands.                                                  |
| Unspecified forestry activities | Employment in unspecified forestry activities.                                                                                     |

### 15.2 National data

#### 15.2.1 Data sources

| References to sources of information | Quality (H/M/L) | Variable(s) | Year(s)    | Additional comments |
|--------------------------------------|-----------------|-------------|------------|---------------------|
| Samoa Forestry Division              | M               |             | 1990, 2000 |                     |

#### 15.2.2 Classification and definitions

No national classification or definitions on forestry employers

#### 15.2.3 Original data

No original data

### 15.3 Analysis and processing of national data

#### 15.3.1 Estimation and forecasting

There is no official statistics kept by the Samoa Forestry Division on number of employees actively working within the country's forestry sector nor their work division or nature of work. The data supplied is based on expert knowledge and estimation of workers in the public and private sector.

#### 15.4 Data for National reporting table T15

| FRA 2005 Categories             | Employment (1000 person-years) |            |
|---------------------------------|--------------------------------|------------|
|                                 | 1990                           | 2000       |
| Primary production of goods     | 0.5                            | 0.3        |
| Provision of services           | 0.06                           | 0.03       |
| Unspecified forestry activities |                                |            |
| <b>TOTAL</b>                    | <b>0.6</b>                     | <b>0.3</b> |

#### 15.5 Comments to National reporting table T15

As described and explained above, the data supplied is based on expert knowledge and estimation made by the Samoa Forestry Division on forestry workers working both in the public and private sector.