Forestry Department
Food and Agriculture Organization of the United Nations

ANALYSIS OF QUESTIONNAIRES AND STATISTICS ON FOREST MAR IN THE SOUTH PACIFIC COUNTRIES

BANGKOK, DECEMBER 2007

MAR-SFM Working Paper 33 / 2007

Strengthening Monitoring, Assessment and Reporting (MAR) on Sustainable Forest Management (SFM) in Asia (GCP/INT/988/JPN)

FAO has implemented the project "Strengthening Monitoring, Assessment and Reporting (MAR) on Sustainable Forest Management (SFM) in Asia" (GCP/INT/988/JPN) (abbreviated as the "MAR-SFM Project") since January 2006. This five-year project is funded by the Government of Japan.

The main objective of the MAR-SFM Project is to develop a globally harmonized forest-related national MAR system to contribute directly to the improvement of SFM regimes in the Asia-Pacific region. Allied objectives of the project are to enhance the use of the MAR information in national decision-making, formulation of effective forest policies, and sustainable forest management and planning.

The MAR-SFM Project will accomplish its objectives in two phases. During the development phase for the first two years, the project would focus on: (a) international activities like the establishment of linkages with forest-related processes; (b) development of a globally harmonized framework, guidelines and database structure, including pilot testing in some countries; (c) use of MAR information in policy development and planning on forests at the national level; (d) establishment of in-country networks of national focal points to various forest-related processes; and (e) a set of national activities that facilitate the implementation of the harmonized MAR.

The implementation phase spreads over the remaining three years of the project period and focuses on the implementation of the harmonized MAR, including facilitation in the establishment of database at the national level in selected project countries within the Asia-Pacific region through studies, reviews, training, workshops and expert consultations. The detailed design of this phase will be finalized on the basis of a review of outcomes of the project activities at the development phase.

All countries in the Asia-Pacific region can participate in the MAR-SFM Project, although the actual level and intensity of their participation may vary among each others. Up to November 2007, forestry departments in 26 countries have nominated their national focal points for the project.

FAO in collaboration with the Forest Agency of Japan, the International Tropical Timber Organization (ITTO), the International Network for Bamboo and Rattan (INBAR), and the FAO - Norway project organized the inception workshop on the MAR-SFM Project in Sapporo, Japan, 24 - 28 July 2006. The workshop reviewed the current status of MAR in project countries, briefed participating national focal points on the project, and deliberated on a work plan of project activities. After that, the project implemented a planning workshop with 19 countries in Chiang Mai, Thailand, 31 October - 2 November 2006, a training workshop on the remote sensing-based land cover classification system with 19 countries in Dehradun, India, 4 - 8 December 2006, a workshop on harmonization of national forest inventories (NFIs) with 19 countries in Beijing, China, 26 - 31 March 2007, and a training workshop on MAR with 9 countries in Nadi, Fiji, 10 - 12 October 2007.

FAO - Regional Office for Asia and the Pacific (FAORAP) in Bangkok manages the MAR-SFM Project in close coordination with the Forest Resources Development Division (FOMR) of FAO Headquarters in Rome and other collaborating organizations. Contact persons are:

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(Strengthening Monitoring, Assessment, and Reporting (MAR) on Sustainable Forest Management (SFM) in Asia) (GCP/INT/988/JPN)

Introduction

The MAR-SFM Project conducted questionnaire surveys on MAR-SFM with eight Pacific countries to comprehend the status of development of MAR prior to the Workshop on Monitoring, Assessment, and Reporting for Sustainable Forest Management in the South Pacific Region, Nadi, Fiji, 10 - 12 October 2007. The responding countries include Fiji, Kiribati, Micronesia, Papua New Guinea (PNG), Samoa, Solomon, Tonga, and Vanuatu. The questionnaire focused on overall national monitoring and assessment systems, including applied remote sensing/GIS techniques, ground-level surveys or national forest inventories, forest/land cover classification, national and international reporting systems, use of MAR information, and coordination/collaboration.

1. Remote sensing/GIS

Seven countries replied that they had ever applied remote sensing by satellite imagery or aerial photograph. Kiribati has no experiences in remote sensing, though supported by the Secretariat of the Pacific Applied Geoscience Commission (SOPAC). They responded that the purpose of utilization of remote sensing and GIS was to update forest resources information especially by highlighting changes of forest conditions and refining forest classifications. Applied sensors were Landsat 5 (PNG) or TM7 (Fiji) and GIS software was Erdas (ver.9) (Fiji, Solomon) or Mapinfor (ver 7-8) (Fiji, Samoa). In Mcironesia GIS is used only in one state (Yap State) for forestry and invasive species monitoring.

However, three countries (PNG, Tonga, Vanuatu) have not conducted remote sensing surveys in recent days. Other institutions support the forestry administration in remote sensing, such as the SOPAC which supports many Pacific counties. In Vanuatu Ministry of Lands also assist the Department of Forests in remote sensing. The interval of monitoring is 5 to 10 years in 3 countries (Fiji, Samoa, Micronesia), while four other countries conducted the remote sensing survey only once.

Available information through remote sensing surveys include:

- Forest areas (7 countries)
- Roads (7 countries)
- Forest types (6 countries)
- Topography (5 countries)
- Other land use/vegetation (5 countries)
- Administrative boundary (4 countries)
- Hydrology (4 countries)
- Crown closure (3 countries)
- Tree species composition (2 countries)
- Tree damage (2 countries)

- Biodiversity (1 country)
- Soils (2 countries)
- Rainfall (1 country)

Only two countries (Fiji, Samoa) have updated satellite-based maps. No other countries could update them due to lack of funds, skills, base maps, or recent images.

The countries request training and regular technical assistance as well as financial support for better access to satellite imagery such as Landsat.

2. Ground monitoring/NFI

6 countries have implemented ground monitoring. Project-based surveys are conducted in PNG instead of systematic NFI. Kiribati and Tonga have no experience. However, their surveys are sporadic, not conducted more than 3 times during 1975 - 2005. The interval of NFI surveys is 10 to 15 years in 4 countries (Fiji, Micronesia, Samoa, Vanuatu) and only once in Solomon. Applied sampling techniques were stratified random sampling and systematic sampling. Four countries (Fiji, Micronesia, PNG, Samoa) established permanent plots.

Information contained in NFI includes:

- Geophysical information
  - Forest location (6 countries) (using GPS in 4 countries)
  - Topography (6 countries)
  - Hydrology (5 countries)
  - Administrative boundary (5 countries)
  - Soils (4 countries)
  - Geology (3 countries)
  - Rainfall (3 countries)

- Biophysical information
  - Number of living trees (4 countries)/dead trees (3 countries)
  - Stand density (4 countries)
  - Basal area (4 countries)
  - Diameter at breast height (DBH) over bark (4 countries)
  - Total tree height (3 countries)
  - Commercial stem (2 countries)
  - Crown diameter (2 countries)
  - Tree growth rate (2 countries)
  - Regenerated stock volume (2 countries)
  - Mortality/ingrowth (1 country)
  - DBH inside bark (1 country)
  - Stump height (1 country)
  - Twigs/branches (1 country)
    - Survey of sampled trees (4 countries)
    - Survey of all trees (1 country)

- Forest extent
  - Actual forest area (5 countries)
  - Legislative forest area (4 countries)
  - Other land area (4 countries)
  - Area of forestland under each management category (4 countries)

- Forest type/originality
  - Primary forest (5 countries)
  - Plantations for production (4 countries)
  - Protective plantations (3 countries)
  - Semi-natural forest (3 countries)
  - Modified natural forests (2 countries)
- Ecological distribution
  - Mangrove (8 countries),
  - Lowland/costal forest (5 countries)
  - Shrubs (5 countries)
  - Grassland (5 countries)
  - Montane forest (4 countries)

- Function
  - Conservation (6 countries)
  - Watershed protection (6 countries)
  - Commercial production (6 countries)
  - Socio-cultural services (4 countries)
  - Production for local use (3 countries)

- Forest ownership
  - State forest (5 countries)
  - Private forest (companies, individuals) (5 countries)
  - Communal forest (5 countries)
  - Churches/schools (1 country)
  - Local government (1 country)

- Production forests
  - Growing stock (6 countries)
  - Merchantable volume (6 countries)
  - Growth rate (5 countries)
  - Actual annual cut of trees (5 countries)
  - Annual allowable cut of trees (4 countries)

- Biodiversity
  - Tree species (6 countries)
  - Herbaceous species (4 countries)
  - Shrub species (3 countries)

(Other elements of biodiversity (fauna, fern, fungi, lichen, bacteria, etc.) were not yet assessed.)

- Assessment of biomass/carbon is not yet common.

- Disturbances
  - Cyclone/storm (3 countries)
  - Illegal use/settlement (2 countries)
  - Fire (2 countries)
  - Invasive species (1 country)
  - Pest/disease (no countries)

- Socio-economic value
  - Non-timber forest products (4 countries)
  - Non-economic benefits of forests (4 countries)
  - Tourism (3 countries)
- Institutional aspect
  - Forest policy (6 countries)
  - Administration (6 countries)
  - Budget (5 countries)
  - National planning (4 countries)
  - Research & education (3 countries)

The countries used the following referential data to compile NFIs:

- Reports from central governments (6 countries)
- Reports from local governments (5 countries)
- Base maps (6 countries)
- Official statistics (6 countries)
- Research papers (4 countries)
- Aerial photographs (4 countries)
- Satellite imagery (3 countries)
- FAO statistics (1 country)

However, 2 countries pointed out inconsistency among varied data sources.
Data formats in NFIs were reports in 6 countries, computerized database in 6 countries, statistics in 5 courtiers, and maps in 5 countries. Users of NFIs were central forestry administration (6 countries), private sectors or companies (5 countries), other central governments (4 countries), local governments (4 countries), NGOs (4 countries), communities (4 countries), research institutes (4 countries), politicians (3 countries), and universities (2 countries). However, NFI data cannot yet be fully open to policy makers, politicians or the general public because of lack of their accuracy or reliability.

For improvement of NFI, the countries suggested exchange of NFI methodologies and experiences among them. Intensification of NFI is required with more frequencies (e.g., every five years) and more plots. Permanent sample plots need to be increased for continuous NFI. The countries request funding and training especially to local forestry institutions. It is also essential to develop feasible NFI systems for small Pacific countries in view of cost-effectiveness and ecological uniqueness. Small reforestation areas or community plantations are not easy to assess accurately. The countries desire technical assistance by FAO for strengthening national NFI systems.

3. Forest definitions/classifications

The Pacific countries have not yet set clear definitions of forests. The five countries disclosed forest definitions, but they are mutually different as follows:

- Fiji: 40% tree cover (tree, bamboo, palm, fern)
- Kiribati: Forests or trees outside forests for non-agricultural or ecological service for the purpose of sustenance of lives
- Samoa: Area covered with tree species for habitats, water protection
- Tonga: Areas with trees (agroforestry areas with other crops)
- Vanuatu: Structural formation/floristic association of the vegetation

These definitions do not coincide with international standard definitions, including FAO. Three countries have no clear definitions of forests.

Three countries have not yet developed forest classification systems. PNG has elaborated the Forest Inventory Mapping Systems in which forest types are categorized by crown density using aerial photos. Vanuatu classifies vegetation types according to the resource information system. Some other countries have the following categories:

- Solomon: Commercial, semi-commercial, logged-over (post-logging stock), merchantable, degraded (no stock), plantation, protected forests
- Tonga: Plantation Forest, Natural/Secondary forest, agroforest
- Vanuatu:

Criteria and methods need be elaborated for adequate classification of forests in Pacific countries.

The countries suggested the following matters for harmonization of forest definitions and classifications:

- Conformity of forest definitions and classifications to FRA for easier reporting
- Reconsideration of classification systems in view of other ecological issues and similarity to neighboring countries
- Cooperation among stakeholders on land use information
- Conformity to the standardization process
- Identification of specific areas for various forest functions

4. National/international reporting

Providers of forest data are mostly forest administration (countries), though other organizations (NGOs, donor-funded forestry projects, etc.) also provided data. Users of data include companies (forest industries), land/forest owners, loggers and investors, central/provincial governments, policy makers and planners, NGOs, universities, donor agencies and their projects, and the general public. Only one country (Samoa) provides a national report on forests. Three out of the seven countries answered that provided data were consistent. Other countries pointed out problems of data inconsistency on account of lack of coordination inside the government on data harmonization, insufficient cross-check of different data sources, and lack of data standardization processes. They are occasionally assisted by NGOs for supplementing data.

The number of countries that participate in each international reporting processes is as follows:

CBD	UNFCCC	FRA	UBCCD	UNFF	IPCC	CITES	ITTO (C&I)	Montreal C&I	Ramsar	CMS	IPCC
6	6	5	5	4	4	4	3	2	2	1	1

Reporting institutions include government agencies on forestry, environment, meteorology, land, and trade. The countries face difficulties in reporting on specific aspects such as biodiversity, biomass, fuel, carbon, forest disturbances, non timber forest products, growth rate and (e.g., mean annual increment, etc.). The cannot provide data easily on recent changes in actual forest areas and area-based information such as forest area estimates by type due to the lack of updated data.

The countries suggested the improvement of international reporting through:
- Construction of the MAR Website
- Accommodation of reporting systems in consideration of small island uniqueness
- Technical support from FAO and other united nations organizations
- Institutional coordination
- Training and funding to national/local institutions
- Facilitation on standardization of international reporting processes
- Introduction of remote sensing/GIS components for updated reporting
- Review of NFIs for accommodation to reporting
- Deliberations on cost-effective provision of forest data in small islands

5. Use of MAR information

7 countries use MAR information for formulation and revision of national forestry policies and forest planning on forest management (e.g., determination of logging codes, annual quota, etc.) and biodiversity conservation, development of NFI, and thematic reports on biodiversity and other issues.

The countries raised requirements for strengthening the use of MAR information such as:
- Improvement of community awareness of forest stewardship for enhanced data provision and utilization
- Development of forest inventory and assessment on biodiversity
- Provision of effective tools and systems including remote sensing (satellite imagery, aerial photographs) and GIS for policy review and planning
- Regular update of forest information (e.g., updating every 3 years)
- Strengthening of the integrated monitoring and enforcement process
- Capacity building on technology of MAR information management
- Review of NFI data

6. Coordination and collaboration

Four countries established national networks on MAR, our of which 3 countries hold regular meetings. Forest information is shared through distribution of publications in 8 countries, regular meetings in 7 countries, ordinary or personal communications in 6 countries, and websites in 4 countries, and workshops in 1 country.

Four countries have experienced collaboration with international organizations on MAR such as FAO, GTZ, Australia, and New Zealand. Four countries also received training on MAR-SFM (NFI, remote sensing/GIS, forest management, etc.) from the Australian university, JICA, GTZ, and national institutions (the land agency)

7. Forest statistics in Pacific countries in international reports

Appendix compiles forest-related statistics in the 14 Pacific countries excerpted from official statistics of FAO and other organizations. Although Pacific island countries provide basic data on forest areas and forest functions, they still lack detailed data on forest changes, forest types and thematic issues (growing stock, biomass, carbon, etc.). Comprehensive data collection and management processes will need to be elaborated with the assistance from international organizations.

8. Synthesis

Although they have some experiences in forest MAR, Pacific island countries still need to improve capacities for continuous collection and management of forest-related data through development of harmonized MAR processes. Improvement of data quality is essential for effective use of MAR information for decision making on SFM. They desire training of foresters for field data collection and technologies of remote sensing and GIS for analysis of spatial information. FAO and the MAR-SFM Project are expected to provide technical assistance on MAR and FRA.

Harmonized forest definitions and classifications should be considered for Pacific island countries in view of their unique ecosystems. Harmonization of MAR processes and consideration of unique island characteristics should be well-balanced. Furthermore, cost-effective MAR systems need to be developed for small island countries. Thematic forest assessment will need to be strengthened for diversified reporting and policy development in accordance with international reporting guidelines. Capacity building and funding issues are crucial for ensuring periodic forest monitoring and regular updating. Regional and in-country collaboration should be accelerated for facilitation in forest MAR by complementing technical and financial resources.

Appendix Statistics on forest resources in Pacific countries in international reports

1. Status of forest cover

Country	Forest Area (1,000 ha)	Proportion of Forest (% area)	Annual change rate of total forest cover(%)		Annual rate of forest change (%)	Other wooded land (1,000 ha)
			1990 - 2000	2000 - 2005		
Australia	163,678	21.3	-0.2	-0.1	-0.2	421,590
Fiji Islands	1,000	54.7	0.2	0.0	-0.2	-
Kiribati	2	3	0.0	0.0	n.s.	-
Micronesia	63	90.6	0.0	0.0	-4.5	-
New Caledonia	717	39.2	0.0	0.0	n.s.	787
New Zealand	8,309	31	0.6	0.2	0.5	2,557
Papua New Guinea	29,437	65	-0.5	-0.5	-0.4	4,474
Samoa	171	60.4	2.8	0.0	-2.1	22
Solomon Islands	2,172	77.6	-1.5	-1.7	-0.2	-
Tonga	4	5	0.0	0.0	n.s.	1
Tuvalu	1	33.3	0.0	0.0	n.s.	0
Vanuatu	440	36.1	0.0	0.0	0.1	476
Total	205,994	24.1	0.1	-0.2	-0.84	429,907

Source:

1. FAO. 2006. Global Forest Resources Assessment: Progress towards Sustainable Forest Management. FAO, Rome. 348 pp. (ftp://ftp.fao.org/docrep/fao/008/A0400E/A0400E00.pdf)
2. FAO. 2005. Forest Products Yearbook. Rome. (ftp://ftp.fao.org/docrep/fao/008/y5985m/)

2. Change in extent of primary forest 1990-2005

Country/area	Area of primary forest (1,000 ha)			% of total forest area			Annual change rate (ha/year)	
	1990	2000	2005	1990	2000	2005	1990 - 2000	2000 - 2005
Australia	-	5,233	5,233	-	3.2	3.2	-	0
Fiji	895	894	894	91.4	89.4	89.4	-100	0
Kiribati	-	-	-	-	-	-	-	-
Micronesia	-	-	-	-	-	-	-	-
New Caledonia	431	431	431	60.1	60.1	60.1	0	0
New Zealand	3,506	3,506	3,506	45.4	42.6	42.2	0	0
Papua New Guinea	29,210	26,462	25,211	92.7	87.8	85.6	-274,800	-250,200
Samoa	-	n.s.	n.s.	-	n.s.	n.s.	-	0
Solomon	-	-	-	-	-	-	-	-
Tonga	-	-	-	-	-	-	-	-
Tuvalu	-	-	-	-	-	-	-	-
Vanuatu	-	-	-	-	-	-	-	-

(Note) n.s.: not significant

Source:

FAO. 2006. Global Forest Resources Assessment: Progress towards Sustainable Forest Management. FAO, Rome. 348pp. (ftp://ftp.fao.org/docrep/fao/008/A0400E/A0400E00.pdf)

3. Forest plantations

Country/area	Area of forest plantations (1,000 ha)			% of total forest area			Annual change rate (ha/year)	
	1990	2000	2005	1990	2000	2005	1990-2000	2000-2005
Australia	1,023	1,485	1,766	0.6	0.9	1.1	46,200	56,200
Fiji	80	101	101	8.2	10.1	10.1	2,100	0
Kiribati	-	-	-	-	-	-	-	-
Micronesia	-	-	-	-	-	-	-	-
New Caledonia	10	10	10	1.4	1.4	1.4	0	0
New Zealand	1,261	1,769	1,852	16.3	21.5	22.3	50,800	16,600
Papua New Guinea	63	82	92	0.2	0.3	0.3	1,960	1,980
Samoa	-	32	32	-	18.7	18.7	-	0
Solomon	-	-	-	-	-	-	-	-
Tonga	n.s.	n.s.	n.s.	0.6	0.6	0.6	0	0
Tuvalu	-	-	-	-	-	-	-	-
Vanuatu	-	-	-	-	-	-	-	-

Source:
FAO. 2006. Global Forest Resources Assessment: Progress towards Sustainable Forest Management. FAO, Rome. 348pp. (ftp://ftp.fao.org/docrep/fao/008/A0400E/A0400E00.pdf)

4. Growing stock, carbon

Country/area	Growing stock composition (3 most common species) (% of total growing stock)	Biomass stock in forest land			
		Above-ground biomass (million ton)	Below-ground biomass (million ton)	Dead wood (million ton)	Total (million ton)
Australia	-	12,929	5,581	4,909	23,419
Fiji	-	-	-	-	-
Kiribati	-	-	-	-	-
Micronesia	-	-	-	-	-
New Caledonia	-	118	28	13	160
New Zealand	-	-	-	-	-
Papua New Guinea	-	-	-	-	-
Samoa	-	-	-	-	-
Solomon	-	-	-	-	-
Tonga	-	-	-	-	-
Tuvalu	-	-	-	-	-
Vanuatu	-	-	-	-	-

Source:
FAO. 2006. Global Forest Resources Assessment: Progress towards Sustainable Forest Management. FAO, Rome. 348pp. (ftp://ftp.fao.org/docrep/fao/008/A0400E/A0400E00.pdf)

5. Forest type

Country/area	Forest (1.000 ha)						Other wooded land (1,000 ha)					
	Total area	Primary	Modified natural	Semi-natural	Productive plantation	Protective plantation	Total area	Primary	Modified natural	Semi-natural	Productive plantation	Protective plantation
Australia	163,678	5,233	156,679	-	1,766	-	421,590	-	-	-	-	-
Fiji	1,000	894	5	-	101	-	-	-	-	-	-	-
Kiribati	2	-	-	-	-	-	-	-	-	-	-	-
Micronesia	63	-	-	-	-	-	-	-	-	-	-	-
New Caledonia	717	431	277	-	10	-	787	412	375	-	-	-
New Zealand	8,309	3,506	2,951	-	1,832	20	2,557	411	2,146	-	-	-
Papua New Guinea	29,437	25,211	4,134	-	92	-	4,474	-	-	-	-	-
Samoa	171	n.s.	110	29	21	11	22	-	11	4	4	2
Solomon	2,172	-	-	-	-	-	-	-	-	-	-	-
Tonga	4	-	4	-	n.s.	-	1	-	1	-	-	-
Tuvalu	1	-	-	-	-	-	-	-	-	-	-	-
Vanuatu	440	-	-	-	-	-	476	-	-	-	-	-

Source:
FAO. 2006. Global Forest Resources Assessment: Progress towards Sustainable Forest Management. FAO, Rome. 348pp. (ftp://ftp.fao.org/docrep/fao/008/A0400E/A0400E00.pdf)

6. Forest ownership/functions

Country	Forest ownership			Designated function of forests (%)					
	Public	Private	Other	Production	Protection	Conservation	Social services	Multiple purpose	None or unknown
Australia	72.0	27.1	0.9	8.0	-	13.1	-	77.6	1.3
Fiji	6.8	93.2	0.0	10.1	33.9	7.4	0.0	48.7	0.0
Kiribati	0.0	100.0	0.0	-	-	-	-	-	-
Micronesia	-	-	-	-	-	-	-	-	-
New Caledonia	73.8	0.8	25.4	2.8	14.4	9.9	8.4	2.8	61.8
New Zealand	63.4	36.6	0.0	22.0	0.2	77.7	-	-	-
Papua New Guinea	3.1	0.0	96.9	24.8	-	4.6	-	4.9	65.7
Samoa	98.2	1.8	-	47.1	20.4	16.7	4.2	5.0	6.7
Solomon	-	-	-	-	-	-	-	-	-
Tonga	100.0	-	-	0.6	-	-	-	-	99.4
Tuvalu	-	-	-	-	-	-	-	-	-
Vanuatu	-	-	-	-	-	-	-	-	-

Source:
FAO. 2006. Global Forest Resources Assessment: Progress towards Sustainable Forest Management. FAO, Rome. 348pp. (ftp://ftp.fao.org/docrep/fao/008/A0400E/A0400E00.pdf)

7. Information status

Country / Area	Most recent data on forest area			Forest Area Time Series	Forest Area Projection	Growing stock Time series	Biomass Estimation
	Field survey/ mapping	Remote sensing	Expert estimate				
Australia	2002	2002	2005	MLT	MOD	NDA	NDA
Fiji	2002			MLT	MOD	NDA	NDA
Kiribati			1996	SIN	ANC	NDA	NDA
Micronesia	1983			SIN	ANC	SIN	GPG
New Caledonia	1974		1999	SIN	ANC	SIN	GPG
New Zealand		2002		MLT	LEM	NDA	G&N
Papua New Guinea	1996			MLT	LEM	SIN	NDA
Samoa		2003		MLT	LEM	NDA	NDA
Solomon Islands	2003			MLT	LEM	NDA	NDA
Tonga	1998			SIN	ANC	NDA	NDA
Tuvalu			1983	EXP	ANC	NDA	NDA
Vanuatu	1992			SIN	ANC	NDA	NDA

(Note)
SIN: Data of one time points MLT: data of two or more time points EXP: Expert estimates MOD: model-based estimation ANC: Assumption of no change LEM: Linear interpolation/extrapolation GPG: factors of IPCC Good Practice Guidance G&N: Combination of GPG and national factors by research NDA: No data available
Source:
FAO. 2006. Global Forest Resources Assessment: Progress towards Sustainable Forest Management. FAO, Rome. 348pp. (ftp://ftp.fao.org/docrep/fao/008/A0400E/A0400E00.pdf)

8. International process/mechanism

Country	GFRA	UNFF	UNFCCC	IPCC	CBD	UNCCD	ITTO	UNDSD	CITES	RAMSAR	CMS	IPPC	UNEP	WHC	Total
Australia	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	14
Fiji	Y	Y	Y	N	Y	Y	Y	Y	Y	N	N	Y	Y	N	10
Kiribati	Y	N	N	N	Y	N	N	Y	Y	N	N	Y	Y	N	6
Micronesia	Y	N	Y	N	Y	Y	N	Y	Y	N	N	Y	N	N	7
New Caledonia	Y	Y	Y	N	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	12
New Zealand	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	14
Papua New Guinea	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	N	Y	Y	N	11
Samoa	Y	N	Y	N	Y	Y	N	Y	Y	Y	N	Y	Y	N	9
Solomon	Y	Y	Y	N	Y	Y	N	N	Y	N	N	Y	Y	N	8
Tonga	Y	N	Y	Y	Y	Y	N	Y	Y	N	N	Y	Y	N	9
Tuvalu	Y	Y	N	N	Y	Y	N	N	N	N	N	Y	Y	N	6
Vanuatu	Y	Y	Y	N	Y	Y	Y	Y	Y	N	N	Y	Y	N	10
Total	12	8	10	3	12	11	5	10	11	5	3	12	11	3	9.7

(Note)
Y: ratified N: Not ratified
- 7.3 focal points, 3.6 organizations/9.7 processes per country
- Forestry 19.3%, Conservation/environment 42.1%, Agriculture 9.6%, Foreign affairs 19.3%, Finance 9.6%

Source: Survey, 2006

9. Forest products

Country	Production						Trade (US$)	
	Industrial Round wood ($000m^3$)	Sawn wood ($000m^3$)	Wood-based panel (000 m^3)	Pulp for paper (000 metric ton)	Paper and Paperboard (000 metric ton)	Fuelwood, wood for charcoal ($000m^3$)	Import	Export
Australia	26,734	4,049	2,031	1,170	3,090	3092	1,535,891	1,328,310
Fiji	5	84	10	0	0	37	22,524	20,641
Kiribati	346	0	0	0	0	0	-	-
FSM		0	0	0	0	0	2,110	-
NC	5	0	0	0	0	0	20,138	-
NZ	21,399	4,292	2,054	1,419	813	0	357,767	1,456,886
PNG	1,708	70	79	0	0	5533	8,748	224,295
Samoa	61	21	0	0	0	70	5,655	972
Solomon	554	12	0	0	0	138	-	41,474
Tonga	2	2	0	0	0	0	2,681	-
Tuvalu		0	0	0	0	0	-	-
Vanuatu	28	28	0	0	0	91	1,820	3,017
Total	50,842	8,558	4,174	2,589	3,903	8961	1,957,334	3,075,595

Source: FAO. 2005. Forest Products Yearbook. Rome. (ftp://ftp.fao.org/docrep/fao/008/y5985m/)

10. Trend of forest products

Country	Change from 1999 to 2003 (%)					Rate of Data provision
	Production	Import	Export	Consumption	Production/ consumption	
Australia	108.0	107.5	130.9	105.5	93.9	99.3
Fiji	103.3	153.7	132.6	140.4	75.1	72.8
Kiribati	-----	97.5	-----	100.0	0.0	11.8
FSM	-----	100.0	-----	100.0	0.0	11.8
New Caledonia	100.0	86.5	-----	84.7	23.8	40.4
New Zealand	109.9	109.0	115.3	107.1	160.7	84.6
Papua New Guinea	167.4	79.7	145.7	168.2	201.7	69.9
Samoa	100.0	36.2	100.0	70.4	82.4	69.9
Solomon	95.1	-----	86.2	96.0	190.2	42.6
Tonga	100.0	88.3	-----	87.0	>1,000.0	58.8
Tuvalu	-----	-----	-----	-----	-----	0.0
Vanuatu	100.9	113.3	237.9	141.6	112.4	66.2
Total	107.5	114.5	118.6	105.2	113.4	100.0

Source: FAO. 2005. Forest Products Yearbook. Rome. (ftp://ftp.fao.org/docrep/fao/008/y5985m/)

11. Protected areas

Country	Terrestrial protected areas			% territory	IUCN categories (% area) in terrestrial protected areas			
	Number	Area (ha)	Average size		NR,NP, Sanctuaries (I,II)	Natural monuments, habitat protection (III, IV)	Landscape, sustainable use (V, VI, etc.)	Unclassified/ Others
Australia	6,755	77,461,951	11,467	10.7	66.4	3.4	30.2	0.0
Fiji	39	34,765	891	1.9	58.3	1.4	11.9	28.3
Kiribati	11	5,787	526	7.9	1.2	30.9	0.0	67.9
FSM	9	8,525	947	12.2	0.0	0.0	59.8	40.2
New Caledonia	45	140,048	3,112	7.5	11.5	34.0	0.0	54.5
New Zealand	5,785 (NP: 14)	8,458,603 (NP: 3,066,900)	1,462 (NP: 219,064)	31.5	39.4	41.4	18.2	1.0
PNG	53	4,353,949	82,150	9.4	5.4	1.0	14.4	79.2
Samoa	9	12,961	1,440	4.6	42.5	56.9	0.6	0.0
Solomon	5	69,890	13,978	2.4	1.6	0.0	45.5	52.9
Tonga	4	6,763	1,691	9.0	92.3	0.0	7.7	0.0
Tuvalu	0	0	-----	0.0	-	-	-	-
Vanuatu	26	17998.8	692	1.5	0.0	0.0	37.1	62.9
Average	1,062	7,547,603	10,760	8.2	29.0	15.4	20.5	35.2

Source:

1. World Commission on Protected Areas. World Database on Protected Areas. UNEP/WCMC. (http://www.unep-wcmc.org/wdpa/)
2. World Resources Institute. Earth Trends – Environmental Information. Washington, D.C. (http://earthtrends.wri.org/)

12. Species Protection

Country	Plant species (number)			Animal species (number)			Proportion of menaced animal species		Proportion of menaced plant species	
	Total (higher plants)	Threatened	CITES - Appendix II	Total (vertebrate)	Threatened (vertebrate)	CITES - Appendix I	% Extinct	%Threatened	% Extinct	%Threatened
Australia	15,638	38	511	3,342	217	90	1.8	27.4	0.0	33.1
Fiji	1,518	65	42	445	25	17	0.6	21.2	0.8	50.0
Kiribati	60	-	-	224	5	3	0.0	16.0	?	0.0
FSM	1,194	4	30	577	14	9	1.0	13.4	0.0	75.0
NC	3,250	214	151	758	19	16	2.0	19.9	1.1	77.8
NZ	2,382	21	38	479	91	28	4.0	26.7	0.0	37.5
PNG	11,544	142	260	2,072	112	18	0.1	11.6	0.0	53.8
Samoa	-	2	34	448	11	6	0.0	20.7	0.0	40.0
Solomon	3,172	16	115	538	49	14	1.4	16.3	0.0	26.7
Tonga	463	2	6	141	8	5	1.3	20.5	0.0	60.0
Tuvalu	57	?	-	?	?	2	0.0	22.9	0.0	0.0
Vanuatu	870	9	45	284	14	9	0.6	14.9	0.0	41.7
Average	3,650	51	123	846	51	18	1.4	20.8	0.4	50.6

Source:

1. IUCN/SSC. The IUCN Red List of Threatened Species (Summary Statistics for Globally Threatened Species). (http://www.iucnredlist.org/info/stats)
2. UNEP/CITES. CITES Species Database (http://www.cites.org/eng/resources/species.html)
3. 1997 IUCN Plants Red List. http://www.unep-wcmc.org/species/plants/plants-by-taxon.htm

13. Environmental indicators

Country	CO2 Emission (000 metric ton)	CO2 Emission per capita (000 MTN/1,000 persons)	Total renewable water resources (000m3)	Total renewable water resources per capita (m3)	Annual burnt area (ha)	International environmental agreements ratified
Australia	332,377	16.54	492	25,185	65,918,500	18
Fiji	701	0.78	29	34,330	12,865	10
Kiribati	29	0.28	--	--	--	9
FSM	--	--	--	--	--	7
N. Caledonia	1,746	8.5	--	--	--	23
New Zealand	30,036	7.9	327	85,221	6,177	16
PNG	2,349	0.5	801	159,171	--	14
Samoa	132	0.8	--	--	--	9
Solomon	161	0.4	45	93,405	--	10
Tonga	117	1.2	--	--	--	8
Tuvalu	--	--	--	--	--	8
Vanuatu	62.0	0.3	--	--	--	11
Average	36,771.0	3.72	338.8	79,462.4	21,979,181	11.9

Source:
1. World Resources Institute. Earth Trends – Environmental Information. Washington, D.C. (http://earthtrends.wri.org/)
2. GFMC/ISDR. 2002. Asia-Pacific Fire Statistics of the Global Vegetation Fire Inventory - September 2002. Freiburg. (http://www.fire.uni-freiburg.de/inventory/gvfi/asia_pacif_stat.htm)