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

PROCEEDINGS

WORKSHOP ON MONITORING, ASSESSMENT, AND REPORTING FOR SUSTAINABLE FOREST MANAGEMENT IN THE SOUTH PACIFIC REGION

NADI, FIJI, 10 – 12 OCTOBER 2007

20 NOVEMBER 2007, BANGKOK

# 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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# Executive Summary

The Workshop on Monitoring, Assessment, and Reporting for Sustainable Forest Management in the South Pacific Region was implemented at the Tanoa International Hotel in Nadi, Fiji from 10 to 12 October 2007. Its main objective was to strengthen the system of monitoring, assessment, and reporting (MAR) for sustainable forest management (SFM) in the South Pacific countries. Twenty-five participants attended the workshop from 9 South Pacific countries and 5 organizations. Various technical aspects of MAR were presented and discussed, including concepts and outcomes of the MAR-SFM Project, national forest inventories (NFIs), thematic assessment (biodiversity, biomass, carbon), Global Forest Resources Assessment (FRA) 2010 and other international reporting, remote sensing/GIS, Land Cover Classification System (LCCS), database management, policy development processes, National Forest Assessment (NFA) in the Philippines, other countries' or organizations' experiences, and initiatives for regional collaboration on MAR-SFM. The workshop recommended the strengthening of regional collaboration with countries and related organizations for harmonizing and broadening MAR, including the formulation of a long-term umbrella plan for the South Pacific countries on MAR and development of national/regional networks. FAO is expected to update and accommodate guidelines on MAR so that the countries stay abreast of current methodologies.

# Workshop on Monitoring, Assessment, and Reporting for Sustainable Forest Management in the South Pacific Region

## Tanoa International Hotel, Nadi, Fiji
## 10 - 12 October 2007

## 1. Background and Objectives of the Workshop

The Workshop on Monitoring, Assessment, and Reporting for Sustainable Forest Management in the South Pacific Region was the first workshop of the project "Strengthening Monitoring, Assessment and Reporting (MAR) on Sustainable Forest Management (SFM) in Asia" (the MAR-SFM Project) (GCP/INT/988/JPN) in the sub-region. Past workshops on MAR-SFM addressed the significance of national- and regional-level collaboration for harmonized forest-related MAR. On the other hand, bilateral and multi-lateral collaboration has been active on forestry and forest resources assessment in the South Pacific region.

The main objective of the workshop was to strengthen the system of MAR for the SFM in the South Pacific countries. Specific objectives include the improved understanding of forest MAR in South Pacific countries and the development of a collaboration mechanism among participating countries, FAO, and other organizations for MAR-SFM programs.

## 2. Organization of the workshop

FAO implemented the workshop at the Tanoa International Hotel, Nadi, Fiji, from 10 to 12 October 2007 in close collaboration with the Secretariat of the Pacific Community (SPC), Forest Management Bureau of the Philippines (FMB), Indian Institute of Remote Sensing (IIRS/NRSA), Secretariat of the Pacific Applied Geoscience Commission (SOPAC), and Pacific-German Regional Forestry Project (PGRFP) - GTZ.

## 3. Structure of the Workshop

**Appendix 1** shows the agenda of the workshop made up of welcome/closing addresses, introductory session/background presentations, technical presentations/discussions and wrap-up discussions. Presentations and discussions were made on technical issues of MAR-SFM (e.g., national forest inventory (NFI), remote sensing/GIS for MAR, international reporting, country experience, etc.) and future collaboration in the South Pacific region.

## 4. Participants of the Workshop

**Appendix 2** lists participants of the workshop. Twenty-five participants attended the workshop from 9 South Pacific countries (Fiji, Kiribati, Micronesia, Papua New Guinea (PNG), Samoa, Solomon, Tonga, Tuvalu, and Vanuatu) and 5 organizations (FAO, SPC, FMB, SOPAC, and PGRFP/GTZ). IIRS contributed a presentation to the workshop, although they could not send a participant to Nadi.

## 5. Workshop Sessions

The following is the summary of presentations and discussions during the workshop:

## 5.1. Programs of FAO and other regional institutions

A.  FAO programs

Kailash Govil (FAO) presented the concept of the MAR-SFM Project through introduction of definitions of MAR and SFM and the scope of the United Nations Forum on Forests (UNFF) 7. The MAR-SFM Project aims to develop a harmonized forest-related national MAR system for the improvement of SFM by encouraging the use of MAR information in national decision making.

Masahiro Otsuka (FAO) reported on outcomes of the MAR-SFM Project by reviewing earlier workshops for inception and planning, highlighting the development of national networks and national programs for harmonization of MAR-SFM. He encouraged countries' contributions for the project newsletter and website.

Aru Mathias (FAO) elaborated on FAO's programs in the Pacific region by introducing the FAO Sub-Regional Office for the Pacific Islands (SAPA) which emphasizes capacity building and institutional strengthening for SFM. FAO-SAPA also supports study and elaboration of forestry policy and legislation, forest resources assessment related to Global Forest Resources Assessment (FRA), sustainable utilization of forests and forest products, and the National Forest Programs. It is crucial to secure the budget for MAR in its regular programs.

B.  Other programs

Sairusi Bulai (SPC) introduced SPC's regional forestry programs. SPC is a regional intergovernmental organization with 22 Pacific countries, Australia, France, New Zealand and USA for technical advisory, research and training, established in 1947. The forestry programs in its Land Resources Division consist of the Forests and Tree Program funded by AusAid and the Pacific-German Regional Forestry Project (PGRFP) funded by GTZ for enhancing Pacific countries' capacities to manage forests and tree resources in a sustainable manner. SPC also supports the development of forest policies and land-use planning, participating in international forest policy processes such as the UNFF and creating the Pacific Agriculture and Forestry Policy Network (PAFPN). Planned activities include conservation and management of forest genetic resources, mapping of Asian logging companies in the Pacific, and general advocacy on forestry, forests and climate change together with the Asia-Pacific Forestry Commission (APFC).

Markus Streil (PGRFP/GTZ) presented the PGRFP and its linkage with the MAR-SFM Project. The PGRFP works with public and private stakeholders to improve a framework of national forest policies and management models for SFM through training in 8 Pacific countries. The PGRFP supports the elaboration of national forest inventory (NFI) in Fiji, Samoa and Tonga through data collection and analysis in permanent sample plots, forest classification with land zoning, and monitoring of sawmilling operations. GTZ developed a regional network with FAO, SPC and other organizations for optimal collaboration. GTZ supported the establishment of multi-stakeholder committees in the National Forest Programs (NFPs). The MAR Project is expected to utilize the existing networks. GTZ shares experience with the Government of Fiji for FRA which will be a portal to harmonization of MAR. GTZ will also seek the linkage with the Global Initiative on Forests and Climate of Australia for remote sensing on deforestation.

C. Discussions on collaboration programs

Wolf Forstreuter (SOPAC) commented that SOPAC covers a wide area of activities such as disaster management, costal protection, and underwater protection besides forest/tree management to deal with communities' lifeline, suggesting the significance of linkages between the forestry sector and other sectors (e.g., water, energy, etc.). Tony Leutele (Samoa), Jimmy Wanefaia (Solomon), Samuela Lagataki (Fiji), and Ismael Lebehn (Micronesia) expected capacity building and financial assistance from FAO in collection, management, and use of data for planning on SFM by responding to real future needs for timber. Kailash said that the MAR-SFM Project will provide technical support to the countries, but that it has inadequate funds to support the implementation itself, suggesting other financial schemes of FAO. Aru asked about the harmonization of mapping supported by GTZ with FAO classifications in Samoa. William Arudovo (PGRFP/GTZ) advised that FAO support communities directly. Kailash clarified that some FAO funds are available for communities, though the MAR-SFM Project is based on collaboration with the government.

## 5.2. Country experience in MAR

A. Statistical data on forest resources in the Pacific (presentations/discussions)

Masahiro introduced a variety of statistical data on forests in 14 Pacific countries using statistics of FAO and various other references, including area and types of natural and planted forests and their changes, growing stock, carbon, forest ownership/functions, ratified international processes, forest products, protected areas, species protection, and environmental indicators. He raised issues on the scope, methodology, accuracy, and frequency of forest resources assessment.

During the discussions, Aru advocated consultations among the forestry sector and other stakeholders for preparation of statistics and international reporting. Masahiro asked about the method of harmonization of MAR between the agricultural and forestry sectors. Wolf suggested that each country establish an internet server for effective sharing of information. Aru recommended that some forest information be included in the agriculture census in the Pacific countries. The participants said that most of the reporting was done by the environmental administration. Some participants agreed that the forestry institution had to improve and harmonize data on forest resources and maps with other offices (agriculture, statistics, etc.). Tony underscored a need for a concerted platform of information from various sources. Meanwhile, Vitus Ambia (PNG) pointed out the difficulty in maintaining and updating forest data due to the lack of materials including GIS tools and institutional barriers on data sharing. Kailash showed that FAO integrated guidelines for forest and land-use assessment using the Land Cover Classification System (LCCS) with remote sensing. Jimmy concluded the importance of making nationwide plans for forest data collection by prediction of land-use change.

B. Questionnaire surveys of MAR in the Pacific

Masahiro presented results of questionnaire surveys on MAR with 8 Pacific countries. Most countries use remote sensing (Landsat 5/TM7, aerial photos) and GIS (Erdas ver.9, Mapinfo ver.7 - 8) to monitor changes in forest conditions. However, they are not yet competent in regular satellite monitoring due to the lack of financial resources and skills. Six countries conduct NFI surveys but their frequencies are also limited. A variety of information was collected in the NFI, including characteristics of forests, forest mensuration, disturbances, socio-economic values and policies. However, few countries practice specific assessment of tree growth rates, forest areas by category, biomass, carbon, non-tree biodiversity, and non-wood forest products. The governments, research institutes, NGOs and private companies use NFI and other MAR information for planning of activities, but lack of their accuracy impedes their effective use by decision makers.

Countries have diverse forest definitions and classifications not always compatible with the direction of FAO. The countries have ratified or endorsed various international reporting processes, including the FRA, UNFF, Convention on Biological Diversity (CBD), United Nations Framework Convention on Climate Change (UNFCCC), United Nations Convention to Combat Desertification (UNCCD), International Tropical Timber Organization (ITTO), and Convention on International trade in Endangered Species of Wild Flora and Fauna (CITES). However, they still face problems in reporting detailed and updated forest conditions. They requested the adaptation of reporting to the uniqueness of small islands and considerations for cost-effective data provision. Four countries have already established national networks, and four other countries have collaborated with bi-/multi-lateral organizations on forest resources assessment. The countries desire capacity building by FAO on overall MAR activities.

C. NFI in Fiji

Robert McWilliam (Fiji) presented the third NFI of Fiji conducted during 2005-2007. The NFI was initiated with remote sensing, mapping and field sampling for assessment of the quantity and quality of remaining forests and determination of their economic potential. Landsat 7 images were obtained from SOPAC with the resolution of 25 m for mapping at 1:50,000 with 30 scenes during 2000 - 2002. The simplified definition of FAO was adopted, and training was conducted to field crews with the assistance of GTZ. Satellite images were masked with several parameters such as water for verifying forest classification. Forest functions were defined with vector overlays using information on cadastre, plantations, and topography. Forest areas were verified with the NFI map in 1991, and altering spectral analysis was made with the verification results through consensus with map users.

About 1,100 sample plots were established out of all types of forests for assessment of timber volume and forest regeneration potential. A cluster sample design was applied with a crisscross unit of 0.2 ha in 5 plots. Collected data were slopes, aspects, overall species and indicator species, tree density, tree diameter, merchantable height, log quality, regeneration, and non-timber forest products where available. Expected outputs of the third NFI survey will be forest cover and function maps at 1:50,000 and other scales, documents on current status of forests and methods, a forest information system with raster-based GIS and database, yield tables with growth monitoring, and preparation of permanent forest estates. The issue on forest assessment is strengthening of the institutional memory and knowledge of the Department of Forests and integration of NFI with international processes.

D. MAR in Vanuatu

Rexon Viranamangga (Vanuatu) presented the situation of MAR in Vanuatu. The Department of Forests (DoF) uses the Vanuatu Natural Resources Inventory (VANRIS) and the Forest Resources Information System (FRIS) for planning and policy making, but both of them are out of date. The Department of Lands, Survey and Records is collecting new sets of map data using high-resolution airborne radar imagery and Landsat TM7 images. Current problems on MAR are lack of updated information due to insufficient human and financial resources, and absence of forest management plan. Technical and financial assistance in remote sensing/GIS is highly desired for effective monitoring of forest cover changes. Objectives of the national MAR program are to increase institutional capacities and improve data collection by updating GIS and remote sensing packages. Now the DoF is working with FAO under the MAR-SFM Project to establish a national network of related stakeholders and a national steering committee for program management and conduct a study on methodology of MAR for harmonization of data

collection and policy development. Current challenges are improvement of officers' knowledge of international reporting processes and stakeholders' commitment to the national network.

E. MAR in PNG

Vitus illuminated current situations of MAR-SFM in PNG. A framework for the national MAR-SFM was built by the forestry policy through forest classifications in 1991. However, it was not optimal due to the lack of planning and resources. Aerial photographs were taken in 1973, and the Landsat 5 imagery was used in 1996/97. The Forest Inventory and Mapping System (FIMS) was developed for providing information on national forest coverage for forest management and planning. Currently Mapinfo and ER Mapper were procured with GPS, but no digital datasets are yet available. *Ad hoc* forest surveys provided forest maps at 1:100,000 using topographic base maps and FIMS maps. The immediate challenge is to set up a remote sensing unit in the forestry administration with staff training and digital data acquisition.

NFI surveys have not yet been carried out since 1974 except occasional project-based forest surveys. Field survey data, monthly reporting on logging by companies are used for planning on forest management and reporting to international processes, but their methods need to be improved with models for forecast of future trends. Current database systems consist of the Forest Authority Database (FAD) and the Forest Inventory Processing Systems (FIPS) for data entry, the FIMS for digitized maps, and manual cartographic maps. Lack of coordination among government agencies, obscure reporting responsibilities, and heavy burdens on national correspondents should be overcome for effective reporting. A formal system of MAR will need to be established through awareness building among stakeholders. An intra-network of related officers is set up within the forestry administration to review the policy and guidelines on forests. Then a national network will be organized with various stakeholders for exchange of experience.

F. MAR in Kiribati

Ioane Ubaitoi (Kiribati) reported that there was no framework or fixed system of national MAR in Kiribati. Training is required on satellite-/ground-based monitoring and data management.

G. MAR in Solomon

Jimmy Wanefaia (Solomon) spoke about updates on the status of management of natural forests in Solomon, assessing logging trends. Merchantable wood volume concentrated on western provinces in 1994, but their sustainable logging volume was less than half of it. Unsustainable timber harvest with repeated logging could bring about rapid exhaustion of natural forest resources and consequent loss of foreign revenue, accelerated by growing international timber demand. On the other hand, smallholder plantations are increasing. Some of the natural forests were converted into plantations. Ground-based monitoring is undertaken at plantation sites, from which national forest inventories are prepared. Wood supply will be decreasing sharply from 2010 to 2020 due to the exhaustion of natural forests, but will steadily increase after that as a result of plantation development and reforestation. Future wood will be provided from industrial plantation estates and smallholder plantations. Staff training is essential for forest-related MAR.

H. Discussions on country presentations

Aru asked about the minimum diameter class on the inventory system in PNG, and Vitus answered that it was 20 cm. Vitus pointed out a common problem of insufficient management of forest information within the forest administration. Kailash asked if sampled trees were geo-referenced and if the volume tables were developed for calculating biomass expansion factors in Fiji, while commending broad coverage of sample plots there. Robert answered that geo-

references within the plots had not yet been made, and that biomass had been estimated from national inventories. He mentioned that the use of inventory for predicting volume tables was still limited to the district level. Cenon Padolina (SPC) wondered why coconut plantations were not included in forest resources under FRA despite its importance as a source of timber in Pacific countries. Wolf gave a comment that coconut was important not only for timber but also for bio-fuel, requesting its monitoring in FRA2010. Kailash answered that coconut was still recognized as an agricultural crop, but that such an issue could be raised by sending a request to FAO for finding solutions. Aru added that coconut became an important resource in Fiji and other countries for timber. Ishmael suggested that it be important to discuss issues on criteria of classification of forests and harmonization of international reporting with other sectors.

## 5.3. Global Forest Resources Assessment (FRA) 2010 and other International reporting processes

A. FRA2010

Kailash showed the participants formats of FRA 2010 and its time frame. Reporting tables were increased from 15 tables in FRA 2005 to 17 tables in FRA 2010. There are no major changes in general, but some tables may be altered through further deliberations. (See **Appendix 3** for more details). A training meeting of national correspondents will take place in March 2008. The deadline for the submission of national FRA reports will be March 2009.

B. Other international reporting

Masahiro briefed the participants on reporting processes of UNFF, ITTO C&I, CBD, UNFCCC, UNCCD, and CITES. He also introduced the Collaborative Partnership on Forests (CPF) coordinated by FAO for harmonization of international reporting. Objectives of the UNFF reporting are aversion of loss and degradation of forests, enhancement of forest-based benefits, significant increase of protected or sustainably managed forests, and increase of financial resources for SFM. The multiyear program of UNFF from 2007 to 2015 was endorsed with variable subjects like non-legally binding instrument on all types of forests in 2007. ITTO originated the criteria and indicators on forests for analysis of the forest status at the national and field levels. Seven criteria were identified such as extent of forest resources, biological diversity, forest health and vitality, productive or protective functions of forest resources, socioeconomic functions, and legal, policy and institutional framework. Fifty-seven indicators were determined in 2005.

The CBD reporting is made for assessment of biodiversity status and national strategy and evaluation of the progress toward the 2010 biodiversity target, characterized by broad and collective assessment with various stakeholders. The UNFCCC reporting is made on national circumstances on climate, national inventory of green house gases, and steps to implement the convention. Forest-related UNFCCC reporting covers geographical characteristics, linkage of deforestation with climatic and socio-economic conditions, environmental and socio-economic scenarios, and mitigation assessment on land-use change and forestry. The reporting builds on guidelines of Intergovernmental Panel on Climate Change (IPCC), above all the Land Use, Land-Use Change and Forestry (LULUCF). The UNCCD reporting focuses on country profiles related to desertification, climate, vegetation, land degradation and rehabilitation, socio-economics and science/technologies for evaluation of national action programs for implementation of the convention. The annual CITES report deals with the status of trade of plant or animal species, while the biennial report focuses on legislative measures to enforce the convention.
C. Discussions on international reporting

The participants focused on reporting responsibilities and burdens in their discussions. The forestry or environmental administration (or both) is responsible for international reporting, whereas a few countries are supported by the Ministry of Lands for data provision. They addressed the need for good coordination among these agencies for consistent reporting. Robert requested a clear time frame for FRA reporting processes. Jimmy asked if there was any improvement in the state of forests after reporting to FRA. Kailash answered "Yes on a global scale". Jimmy also suggested the constitution of an NFI expertise team to facilitate the Minister's approval of the collected data. Aru was concerned that some countries would require considerable funds for compiling reports.

Robert brought up issues on reporting such as assessment of biomass and biodiversity from measurement of coniferous and broadleaved trees, calculation of annual allowable cut (AAC) by measurement of mean annual increment (MAI) at permanent sample plots for certification of timber production. Tony and Kailash said that there would be other ways to determine AAC with MAI as the basic information for stabilized and sustainable management and harvest. Robert said that the GTZ model was useful with clustering for better inventories with wood density for timber harvesting by estimating AAC. Kailash suggested the reference to the IPCC framework (Good Practice Guidance) for biomass assessment, mentioning that FRA and UNFCCC had requested information on carbon volume in 2005. Forecast will be made in 2007 under FRA 2010, though specific guidelines would not be formulated on it. Samuela underscored development of a common format and capacity building for FRA. Ishmael pointed out staff shortage in his office and a lot of pressure on focal points.

## 5.4. National Forest Inventory (NFI) and thematic assessment

A. NFI and thematic assessment

Kailash reported outcomes of the Workshop on Harmonization, Broadening, and Cross-sectoral Integration of NFI in Beijing in March 2007, covering NFIs in Asian countries, sampling design, measurement, statistical analysis, forecast and scenario development, the National Forest Assessment (NFA) and the establishment of a regional network of NFI experts. The workshop concluded recommendations for broadening the scope of NFI under the support to the NFA programs and continued discussions on NFI through the regional network.

Masahiro introduced general principles of national forest inventory, dealing with definitions, objectives, typology, planning, sampling techniques, plot establishment, area assessment, forest mensuration (growing stock, growth rate, volume, etc.), and multi-resource inventory coupled with improved forest management, non-wood goods/services, forest ecosystems/biodiversity, landscape analysis, and forest fires.

Masahiro presented biodiversity assessment and its linkage with national forest inventories. Its objective is to enhance management planning for protected areas or areas of biodiversity concern in accordance with the international process. The CBD advocates the 2010 biodiversity target for significant reduction of biodiversity loss and determines the framework of monitoring with 7 focal areas (e.g., forest area by type, protected areas, fragmentation, conversion, disturbances, forest structure, forest dependent species and their conservation status) and 22 indicators. The case of Nepal demonstrates a good example of biodiversity assessment, encompassing satellite remote sensing, field surveys of flora and fauna, sampling techniques, statistical analysis and management diction. Rapid biodiversity/ecological assessment is growing popular for cost-effective assessment and planning on biodiversity protection. A positive linkage between biodiversity assessment and NFI is suggested in terms of woody and non-woody forest

characteristics, addition of biodiversity indicators to existing or new NFIs, linkage of NFI with C& I processes, and reconsideration of NFI methodologies including the rapid assessment.

Masahiro outlined trends of the biomass/carbon stock assessment under FRA 2005 and recommended approaches. Data from Pacific countries were still limited on growing stock, biomass and carbon in FRA 2005. Data were often obsolete and less reliable, not representative to NFIs. Variable country-specific parameters have to be harmonized for FRA 2010. The LULUCF of IPCC provides comprehensive guidelines for biomass and carbon assessment, linking with land use changes in original and developed forests. It offers three tiers of assessment depending on capabilities of countries, but most countries still use the default method. Carbon assessment models are proposed under the FAO/IFAD (International Fund for Agricultural Development) framework through synergies with UNFCCC, CBD and UNCCD. A case study of biomass/carbon assessment in Latin America would be one good example.

B. Discussions on NFI and thematic assessment

Tony emphasized a need for long-term support to Pacific countries on NFI, expecting training of FAO which would incorporate other countries' experience. He also suggested the GIS network with other regions under FRA. Kailash explained that FAO would provide countries with technical resources through training to develop ground-level NFIs. FAO could collaborate with SPC and GTZ to make a long-term plan for regional implementation with the current FAO methodology of NFI. Jimmy underlined training on updated packages of new GIS and RS methodologies to sustain long-term implementation of NFI. Such training courses could be elaborated with related agencies in Asia-Pacific countries through Technical Cooperation among Developing Countries (TCDC). Robert suggested that a list of potential aid donors be made in each country for ensuring small components of funds for capacity building on NFI.

Ambia was concerned about how much assessment of biodiversity, biomass, and carbon would be taken up in FRA 2010, considering countries' limited capacities. Kailash clarified that FRA would deal with air-dried density of biomass using the biomass expansion factor (BEF). There is a generic formula of BEF for calculation of the whole biomass using data on the total above-ground biomass. Default factors will be used for calculation of above- and below-ground biomass ratio. This calculation would affect carbon credit factors. Masahiro suggested that countries complete FRA tables at minimum, while they would decide other thematic assessment upon their capacities. Cenon asked about the methodology of calculation of the BEF factor. Kailash suggested his visit to the FRA and IPCC sites to learn various methods. The participants requested another round of the Pacific workshop on NFI for continued training.

## 5.5. Remote sensing/GIS

A. Remote sensing/GIS

Masahiro reported outcomes of the Workshop on Remote Sensing-based Land Cover Classification in Dehradun in December 2006, covering Global Land Cover Network, Land Cover Classification System, GeoVIS, GeoNetwork, and harmonization processes on forest/land cover classification in Asian countries. The workshop recommended further harmonization of forest classification systems by sharing expertise among countries using regionally adapted LCCS packages, networking of institutions for national forest assessment with remote sensing and sampling design, and capacity building of national staff on LCCS and GeoVIS.

Kailash presented approaches to remote sensing-based forest assessment in conjunction with FRA2010. Global forest monitoring will be made for the year of 1975, 1990, 2000, and 2005 to

obtain baseline data and maps on forests, including area change statistics and information on land-use dynamics. Sampling intensity will be about 1 % of land surface with the sampling size of 10 km x 10 km. Land-use classes will be fixed, including forest, other wooded land, and other land. Remote sensing data will be complementary to national reporting in close linkage with national monitoring systems. National capacities will be built up for remote sensing-based forest monitoring under FRA 2010.

Masahiro introduced the experience of India in remote sensing-based forest monitoring on behalf of Dr. S.P.S. Kushwaha (IIRS). Progress in imaging technology and resolution was demonstrated among NOA-AVHRR, LANDSAT-TM 2001, LISS III 2002, IKONOS MX 2004, etc. Nation-wide or regional-level forest cover maps in India were shown by forest type or category. Visual and digital interpretation of satellite imagery, LCCS-based forest classification, and false-color composite images were introduced to the participants. Dr. Kushwaha concluded good potential of satellite imagery for forest cover mapping and usefulness of LCCS and GeoVIS in mapping and forest assessment.

Wolf presented activities of SOPAC on vegetation mapping and monitoring in the Pacific region, underlining the assessment of coconut palms as potential bio-fuel resources in small island countries. Satellite image data are superseding aerial photographs in the region for lower costs and easier use. On-board tape recorders are used for recoding satellite imagery for 12,100 km$^2$. Vegetation changes in small islands are analyzed using IKONOS. Image-to-image correction can be made between different years with software like ERDAS IMAGINE 8.3.1. Backdrops are created through scanning, geometric correction, and import of GIS layers. Coconut resources were estimated using IKONOS with specific land cover classification (e.g., coconut plantations, natural coconut stands, scattered coconut trees, natural forest cover, grasses and shrubs, etc.). Although young coconut culms cannot be found easily due to the limitation of resolution (currently about 60 cm), high-resolution satellite monitoring and mapping are effective in assessment of coconut palm distribution and planning of land-use and coconut production, saving time for coconut search. Other challenges will be mapping and monitoring of mangroves and breadfruit and monitoring of vegetation cover for water intake.

B. Discussions on remote sensing/GIS

Aru appreciated efforts of SOPAC on vegetation mapping in small islands. However, Vitus doubted the effectiveness of IKONOS and Quickbird for large-scale mapping in large countries like PNG. Wolf advised that the minimal mapping scale be 1:50,000 for the assessment like in Thailand, supporting their usefulness. Tony was concerned about long periods of data collection by aerial photographing and high costs of high-resolution imagery. Kailash suggested the initiative of resource assessment through exchange of information among countries for capturing all resources by their coordination. Ishmael illustrated some initiatives for coordination among regional organizations such as the GIS training for disaster management. Wolf added that the Departments of Forestry, Environment, and Agriculture with NGOs carried out vegetation mapping using forest knowledge through coordination by SPC and SOPAC in Fiji. Other knowledge (e.g., climate change, water supply, remote sensing, rainfall, etc.) were combined with forestry expertise for better assessment. Networking of vegetation mapping and review of GIS data will be considered in due course. Robert highlighted the significance of sharing institutions' skills of remote sensing/GIS for training to the countries. Kailash suggested the UN training on remote sensing/GIS coordinated by regional offices, though they could not bear boarding costs.

## 5.6. National Forest Assessment (NFA) in the Philippines

A. NFA

Carlo Consolacion (FMB) demonstrated the experience of the Philippines in the NFA by presenting its definitions, objectives, methods, and outcomes. The NFA is defined as an entire national process of collecting, managing, analyzing, and using information on forest resources in the whole country, involving scenario development for policy interactions. The FMB of the Philippines implemented the NFA project with FAO to enhance SFM. A field manual was prepared for the assessment in the Philippines, accompanied by training to field crews. Land classifications and definitions were determined in accordance with the FAO standard and the national policy. Sampling design was made of land-use sections (LUS), tracts, and permanent or temporary plots following the general NFA guidelines of FAO. Eight field forms were prepared for recording of data on forest and tree resources. Biophysical and socio-economic information was collected through measurements and interviews. Trees or stumps more than 10 cm dbh (diameter at breast height) were recorded.

FAO developed a database for data management in the Philippines. Collected data were checked, analyzed and reported using the statistical expressions on ratio estimates and the national report outline provided by FAO. The land cover data were published in the Philippine Forestry Statistics of 2003, adopted by the National Statistics Coordination Board. The NFA data were provided to FRA 2005, and they are available upon request from the FMB. The NFA data expedited updating of information on the extent, structure, and composition of national forests, settling a lot of controversial discussions on the forest extent and quality. They also provided bases for localized investment plans for the National Forestry Master Plan and on-going deliberations on a national list of threatened plant species. The Philippine NFA was recently improved by simplifying and refining database and accelerating data analysis with the statistics calculation template developed by FAO. The NFA has contributed significantly to the standardization of data collection techniques, harmonization of forest-related terms/definitions, and better linkages of national information to FRA and other countries.

B. Discussions on NFA

Vitus asked about the difference of terminology between NFA and NFI and if tracking of 200 plots could satisfy needs for data. Carlo answered that the NFA is broader than NFI, including the socio-economic component. NFA would be complementary to NFI with a different reporting system. At first more plots (473) were identified, but reduced to 200 due to hard accessibility and shortage of funds or labor force. Carlo said that the sample number of 200 satisfied the minimal requirement for resources assessment. Robert asked about establishment of plots in natural forests. Carlo answered that the NFA was also designed for intact forest areas with integrated LUS. Different land-use classes were set for different land types in block along the road. Robert suggested networking of external institutions (e.g., universities) through study of their capacities for integration of the assessment. National validation of different assessment systems would also be a crucial issue. Kailash took up the case of Bangladesh where a steering committee had been established for monitoring of NFA and advisory to different systems as a multi-sectoral body with sectors of agriculture, livestock, etc. Carlo also remarked the integration of the NFA questionnaires with other institutions for species identification.

Robert was concerned about the cost of field surveys and the sufficient number of plots. NFA cost US$196,000 in the Philippines. Ishmael was interested to know how the advisory group could cope with land ownership issues to make land information available, including assessment of economic value of land assets against owners' demand for remuneration. According to Carlo, information on private land was sometimes inaccessible as landowners did not allow it. Inaccessible plots were marked and excluded from database. Jimmy asked about distribution of tracks, sample size of trees on the whole land, and financial limitations to sampling. The

Philippines selected crisscross distribution of 15-minute grids instead of 4-minute grids in terms of budget availability. Other discussions include completion of a field form for each different land-use class for 1 - 2 days, implementation of NFA in selected developing countries as guidelines for data collection, and follow-up on the NFA with FRA in the Philippines in 2010.

## 5.7. Management and use of MAR information for SFM

A. Database management

Kailash suggested favorable approaches to database management. Timely, reliable and accurate information on forests and forest ecosystems is essential for public understanding and informed decision making. Good information contributes to good forest management in later periods. Data administration for planning and policy development and data administration for managing the data at an operational level enable effective data preservation and management. Each component has levels of use, information, and infrastructure. In view of physical and technical risks as a result of technological advancements and change of operating systems, a strategy for long-term data preservation has to be elaborated for ensuring good access to and sharing of information. Data preservation might not be susceptible to natural and anthropogenic damage and new software/hardware developments. He added an example of software for photo monitoring: Confluence (http://www.confluence.org) to coordinate images. The issue is how to develop and manage database for long-term forest ecosystem management with reinforced infrastructure.

B. Use of MAR information for SFM

Masahiro illuminated forest information systems (FIS) and current tools for decision making on SFM with the MAR data. The FIS is a modern tool to provide decision makers with comprehensive information or results for better management decisions. Its components include database systems with GIS, modeling/simulation, knowledge-based systems, visualization, artificial neural networks, and integration. Empirical or mechanistic forest simulation models were evolved for forecasting future trends of forest resources, comprised of growth and yield models, succession models, process models, or hybrid models which integrate them. Visualization aims to create virtual worlds substituting for real worlds to facilitate forecast of historic or future changes of forest conditions by classifying and summarizing large spatial data. Geometric modeling, video imaging, or image draping were devised as a visualization tool. A computer-aided decision support system (DSS) was innovated with language, presentation, knowledge, and problem-processing systems. The Earth Summit in 1992 advocated the significance of broad, holistic, and integrated forest ecosystem management. Several tools were invented for this purpose such as Landscape Management System (LMS) and Ecosystem Management Decision Support (EMDS). Perspectives of integration of decision tools and other technologies, internet-based decision making, and participatory decision processes should be further studied.

C. Discussions on management/use of MAR information

Kailash wondered how countries could be helped on data management, if data systems were changed. Robert made a point that models had to be adapted to the Pacific region. Masahiro suggested search for accommodated models by learning the presented models. Wolf indicated that decision making systems would be linked to similarities for management models. Decision making should be made with adequate software/hardware, data, and human resources. Software for analysis of GIS data is available in the Pacific region nowadays. Ishamel asked about the model forestry in countries to be recommended by FAO. Kailash answered that brainstorming would be done for setting up models on forests through FRA with reference to certain models.

## 5.8. Initiative for Regional Collaboration and possible schemes

A. Presentations on regional networking

Masahiro proposed possible approaches to regional collaboration among the Pacific countries. A long-term umbrella plan for Pacific countries (LUPP) could be formulated for continuation of harmonization of MAR after the workshop. The LUPP would facilitate regional coordination on generation, preservation, use, and dissemination of MAR information and fund raising for implementation of regional MAR-SFM programs. Building on existing networks, a regional network on MAR-SFM should be developed among Pacific countries and collaborating organizations for harmonization of MAR systems and their methodology. Regional organizations like SPC are expected to initiate the regional network. Various forms of network will be explored such as e-networks/forums and face-to-face meetings coupled with national networks. The regional network should provide countries with substantial products like newsletters, technical papers, website, and other documents for sharing knowledge and experience on MAR, while interacting with technical resources of other regions or organizations including FAO.

B. Discussions on regional networking

Sairusi assumed that existing networks would have sufficient resources for regional collaboration, such as the PAFPN of SPC which provides information on forestry, supported by international organizations and national governments. It would be better to link the regional MAR network to the existing networks rather than creating another extra network. Wolf informed that a 12-year network on GIS/RS has an e-mail distribution list of 500 members with institutions owning GIS capacities, building database on remote sensing, GIS and GPS. It continues to inform Pacific countries about forest inventory database with GIS/RS. A 14-year GIS/RS newsletter inventory distributes technical notes on GIS/RS to Pacific countries through e-mail distribution, involving people in articles. Markus stressed that it would be better to set up a user group on MAR after the workshop, uploaded on the PAFPN. He also suggested the possible use of Yahoo or Google email groups. A small focus group would be better for its sustainability. Kailash suggested that the network be limited initially to the Pacific countries and regional organizations, and gradually linked to other broader networks in other regions or institutions such as the regional network of NFI in Asia. Networks should not overlap, but separate network setting would be costly. Information should be shared among networks on methodologies of NFI and RS/GIS monitoring.

Meanwhile, Robert pointed out a high maintenance cost of e-mail lists and a long period of newsletter production with various authors. He mentioned that Pacific countries might well establish specific websites for sharing MAR information rather than e-mail lists, containing countries' experiences. FAO is expected to play a lead role in support of the websites, assisted by SPC and SOPAC. Supporting the idea on the Pacific network, Jimmy stressed that its members should be the same with the workshop participants. He hoped that FAO could support the countries for solution of probable technical IT problems like setup of the map server for storing and downloading articles or databases and troubleshooting of server troubles.

Vitus wondered about the effectiveness of the network under the umbrella program in discussion of methodologies with neighboring countries. He recommended that link to existing websites and different networks be considered on NFI, vegetation maps, etc. Robert requested the preparation of a list of available networks so that the proposed network would not duplicate others. Tony was worried that the link of the MAR website to different existing networks might cause a problem such as a series of server breakdown by chain-reaction and loss of all MAR information. He advocated the secure back-up system for the sustainability of the network in collaboration with

SPC and FAO. He preferred to link different websites to a wide network connected to computers. Several participants suggested the decentralized link of websites to the SPC website under its management and others' participation. Sairusi recommended the link of specific Pacific websites to the NFA site for its regional adaptation. Vitus suggested a common platform for easier access from every country.

Kailash advised that the regional network should not be limited to an electronic network, but that a conventional face-to-face network should also be considered for sharing and exchanging information on harmonized MAR. In this regard, Rexon underscored the setup of a national network and a steering committee for constant coordination of focal points of international conventions on information gathering. He requested FAO to facilitate coordination with other processes for harmonization of MAR to eliminate focal points' confusions over their tasks. Kailash advised the participants to visit the CPF website to learn the harmonization of international reporting.

C. Presentations on the Global Environment Facility (GEF)

Kailash clarified 6 focal areas and 2 cross-cutting issues on the Global Environment Facility (GEF). The new strategy of GEF was adopted in July 2007. The 6 focal areas include biodiversity, climate change, international waters, land degradation, ozone layer depletion, and persistent organic pollutants, and 2 cross-cutting issues are sound chemicals management and SFM. Conservation and sustainable use of forest biodiversity and promotion of sustainable management and use of forest resources are addressed for SFM. GEF funds cannot be allocated to developmental features of SFM, including logging operations and reforestation of logged-over forests. Land restoration and forest plantations are included in non-priority areas. Work programs will be approved by the GEF council on 25 April 2008. Countries demanding the GEF support are requested to fill out the Project Identification Form (PIF) briefly with an endorsement letter by the government through designation of a national focal point. He showed the participants the GEF operational calendar, noting that any MAR-related activities as the "windows of opportunity" would be accepted between 15 October and 30 November 2007.

C. Discussions on the GEF

In the discussions on the GEF, Sairusi asked about the formulation of the GEF project, the possibility of support to community forestry, and training to proponents for meeting the GEF requirements. Kailash suggested that he visit the GEF/PIF website to monitor the updated program selection criteria and funding policy which change over time, mentioning that very few Pacific countries had ever been contacted. Masahiro underlined the principle of co-funding with the beneficiary government in the GEF support. Ishmael desired that the GEF would accept in-kind support by the government, considering its serious lack of financial resources. Kailash wondered how much countries could invest in the FIS as a scenario for long-term projection of forests with collected data. The C&I scheme provides information on the extent of forests to inform politicians of what will happen in future forests. The critical factor is forest health, and rational sampling design is needed for justification of information. The electronic network of regional NFI will facilitate this discussion and the GEF proposals could be posted on the network. The participants suggested a brainstorm session to determine important areas for Pacific countries.

## 6. Evaluation of the workshop by the participants

The participants evaluated the workshop at its end. **Appendix 4** compiles results of the participants' evaluation. All of the responding participants evaluated the workshop very good or

fairly good in terms of its content and logistics. They enumerated the most useful sessions in priority order as summarized below:
1. NFA-Philippines
2. Vegetation mapping using RS/GIS in Pacific Islands
3. NFI methodology
4. General aspects of remote sensing/GIS
5. Information on the MAR-SFM Project
6. Discussions on regional collaboration
7. International reporting
8. Country experience in MAR-SFM

Meanwhile, some of the participants suggested further improvement of the workshop, including the reduction and refinement of presentations for their easier absorption as well as the organization of a field visit program. The participants expected a follow-up program after the workshop like the development of regional/national networks and the organization of training workshops on thematic issues of MAR-SFM.

# 7. Conclusions and Recommendations

The participants shared the necessity to establish an appropriate system for harmonization, broadening, and integration of forest-MAR with various developmental and environmental sectors. Appropriate models and approaches should be explored for effective harmonization and application of the MAR system to improve SFM in South Pacific countries in view of unique ecosystems. National capacities need to be increased by enlarging collaboration and networking among related stakeholders.

The participating countries are expected to develop and implement the LUPP on MAR with regional organizations and FAO to coordinate and facilitate generation, preservation, reporting, use and dissemination of forest information regularly and flexibly. FAO and regional organizations should help the countries raise funds for the LUPP from potential funding schemes to implement MAR. Collaboration and information exchange among the countries under the TCDC as well as regional technical cooperation with bilateral/multilateral agencies and NGOs are recommended. FAO is also requested to update guidelines on MAR-SFM regularly and provide the countries with latest technologies and methodologies, while taking up their technical feedback through effective communications.

Regional/national networks on MAR-SFM should be developed with potential stakeholders among the countries and collaborating organizations for harmonization of MAR-SFM after this workshop. The regional network should build on the existing forestry network to formalize the LUPP and develop common methodologies of MAR in the Pacific region. Regional experience in forest-related MAR should be widely circulated and further reinforced for improvement and updating of national MAR systems. FAO is expected to link the network of Pacific countries with the MAR website and training workshops in other regions to enable them to share skills and experiences with other regions of the world. The regional and national networks could be initiated in several forms, including e-forums, e-networks, websites, and conventional face-to-face exchanges in conjunction with other schemes or meetings.

# Acknowledgements

## Appendix 1 - Agenda of the workshop

**Workshop on Monitoring, Assessment, and Reporting for Sustainable Forest Management in the South Pacific Region, Tanoa International Hotel, Nadi, Fiji Islands, 10 - 12 October 2007**

Organized by FAO in collaboration with Department of Forest (Fiji), Secretariat of the Pacific Community (SPC), Forest Management Bureau of the Philippines (FMB), Indian Institute of Remote Sensing (IIRS/NRSA), Secretariat of the Pacific Applied Geoscience Commission (SOPAC), Pacific-German Regional Forestry Project (PGRFP) - GTZ

**WEDNESDAY, 10 OCTOBER**

08:00 - 08:30  Registration

➢ **Opening addresses (08:30 - 09:30)** (the conference room)

08:30 - 08:40  Welcome address by FAO (Kailash Govil)
08:40 - 08:50  Opening address by the hosting government (Fiji) (Samuela Lagataki)
08:50 - 09:20  Self-introductions by resource persons:
    08:50 - 08:55 IIRS (NRSA) - India (Satya P.S. Kushwaha)
    08:55 - 09:00 FMB/DENR - Philippines (Carlo P. Consolacion)
    09:00 - 09:05 SPC (Sairusi Bulai)
    09:05 - 09:10 PGRFP - GTZ (Mateboto K. Jalesi)
    09:10 - 09:15 SOPAC (Wolf O. Forstreuter)
    09:15 - 09:20 NFI Project - Fiji (Robert R. McWilliam)
09:20 - 09:30  Self-introductions by participants

09:30 - 10:00  *Refreshments (coffee/tea break at the Hotel)*

➢ **Introduction (10:00 - 11:15)** (Plenary session at the conference room)

10:00 - 10:10  Presentation (P.): Introduction to the workshop (Masahiro Otsuka/FAO)
10:10 - 10:20  P.: Concept of the MAR-SFM Project (Kailash Govil/FAO)
10:20 - 10:30  P.: Outcomes of the MAR-SFM Project (Masahiro Otsuka)
10:30 - 10:45  P.: FAO Programs in the Pacific region (Aru Mathias/FAO)
10:45 - 11:15  Discussions

➢ **Background presentation and discussions (11:15 - 12:00)** (Plenary session)

11:15 - 11:30  P.: Overview of forest statistics in the Pacific region (Masahiro Otsuka)
11:30 - 12:00  Discussions

12:00 - 13:00  *Free lunch at the Hotel*

➢ **Presentations on MAR-SFM in the Pacific region (13:00 - 15:30)** (Plenary session)

13:00 - 13:15  P.: Summary of questionnaire surveys (Masahiro Otsuka)
13:15 - 14:30  P.: Country experience and regional collaboration in MAR-SFM
    13:15 - 13:30 The NFI Project in Fiji Islands (Robert R. McWilliam/NFI-Fiji)
    13:30 - 13:45 Vanuatu (Rexon Viranamangga/VoF)
    13:45 - 14:00 Papua New Guinea (Vitus B. Ambia/PNGFA)
    14:00 - 14:15 Kiribati (Ioane Ubaitoi/MELAD)
    14:15 - 14:30 Solomon (Jimmy I. Wanefaia)
14:30 - 14:45  P.: SPC's support for sustainable forest management in the Pacific region
                (Sairusi Balui/SPC)

14:45 - 15:00  P.: Pacific-German Regional Forestry Project (Streil Markus/GTZ)
15:00 - 15:30  Discussions

15:30 - 15:45  *Refreshments*

➢ **Presentations and discussions on international reporting processes  (15:45 - 17:30)** (Plenary session)

15:45 - 16:00  P.: Global Forest Resources Assessment (FRA) (Kailash Govil)
16:00 - 16:15    P.: Global Environmental Facility (GEF) - Project Identification Form (PIF) (Kailash Govil)
16:15 - 16:30  P.: Other international reporting (Masahiro Otsuka)
16:30 - 17:30  Discussions
    √  FRA
    √  UNFF
    √  CBD
    √  UNFCCC and others

19:00 -    Welcome dinner at the Tanoa International Hotel


**THURSDAY, 11 OCTOBER**

➢ **Presentations and discussions on National Forest Inventory (NFI) methodology (08:30 - 12:00)** (Plenary session)

08:30 - 08:45  P.: Summary of the workshop on harmonization, broadening, and cross-sectoral integration of
                  NFI, Beijing, March 2007 (Kailash Govil)
08:45 - 09:00  P.: Development of NFI: general principles (Masahiro Otsuka)
09:00 - 09:30  Discussions
09:30 - 09:45  P.: Thematic issues on NFI 1:  Biodiversity (Masahiro Otsuka)
09:45 - 10:00  P.: Thematic issues on NFI 2: Biomass/carbon (Masahiro Otsuka)
10:00 - 10:30  Discussions

10:30 - 11:00  *Refreshments*

11:00 - 11:15  P.: Use of NFI data for policy/planning on forest management (Masahiro
                  Otsuka)
11:15 - 12:00  Discussions

12:00 - 13:30  *Lunch*

➢ **Presentations and discussions on remote sensing/GIS and database management for MAR in the South Pacific region (13:30 - 17:00)** (Plenary session)

13:30 - 13:45    P.: Summary of the workshop on remote sensing-based land cover classification, Dehradun,
                  December 2006 (Masahiro Otsuka)
13:45 - 14:00    P.: Remote sensing and Global Forest Resources Assessment 2010 (Kailash Govil)
14:00 - 14:20    P.: Experience of India in remote sensing-based forest monitoring (S.P.S. Kushwaha/IIRS)
14:20 - 14:40    P.: Vegetation mapping and monitoring in Pacific Island countries (Wolf O.
                  Forstreuter/SOPAC)
14:40 - 15:30    Discussions

15:30 - 16:00  *Refreshments*

16:00 - 16:15    P.: Database management for sustainable forest management (Kailash Govil)

16:15 - 17:00  Discussions

**FRIDAY, 12 OCTOBER**

➢ **Presentations and discussions on the National Forest Assessment (NFA) (with the case from the Philippines) (08:30 - 12:00) (Carlo P. Consolacion/FMB)** (Plenary session)

08:30 - 09:30  Presentations on NFA 1
- Introduction to the NFA approach (background, objectives and importance)
- Introduction to the NFA project and manual in the Philippines
  - Global and national land-use classes
  - NFA sampling design
  - Data collection techniques/methodology

09:30 - 10:00  Discussions

10:00 - 10:30  *Group Photo/Refreshments*

10:30 - 11:30  Presentations on NFA 2
- Introduction to the NFA project and manual in the Philippines (continued)
  - Data entry, processing and analysis
  - Reporting
- Use of NFA information
- Updates on NFA
- Suggestions for application of NFA in the Philippines

11:30 - 12:00  Discussions

12:00 - 13:30  *Lunch*

➢ **Discussions on regional collaboration with South Pacific countries (13:30 - 15:30)** (Plenary session)

13:30 - 15:30  Discussions on regional collaboration
- National/regional programs on MAR-SFM (national/regional networks, harmonization processes)
- Linkages with the MAR-SFM Project and other programs of FAO
- Collaboration with other organizations
- Sub-regional collaboration (networking) among countries

15:30 - 16:00  *Refreshments*

➢ **Conclusions/recommendations (16:00 - 17:00)** (Plenary session)

16:00 - 16:40  Conclusions/recommendations
16:40 - 16:50  Closing remarks
16:50 - 17:00  Delivery of certificates/material (CD-ROM)

## Appendix 2 - List of Participants

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# *Appendix 3 - List of changes and amendments by reporting table*

| FRA 2010 reporting table | Changes and amendments in relation to FRA 2005 reporting |
|---|---|
| T 1 Extent of forest and other wooded land | No major changes, only some additional explanatory notes |
| T 2 Forest ownership and management rights | Ownership relates to the forest resources (trees) and not to the land<br>An additional table on the management rights of public forests (transfer of rights to different user categories) |
| T 3 Forest designation and management | Only reporting on primary designated function – total area with function removed.<br>A number of special categories related to forest management added. |
| T 4 Forest characteristics | Reporting only on primary forest and planted forest (the categories modified natural, semi-natural and forest plantations removed). Planted forest split on native and introduced species.<br>A new sub-table with some special forest categories added. |
| T 5 Forest establishment | New table for reporting on afforestation, reforestation and natural expansion of forest |
| T 6 Growing stock | No changes on growing stock<br>Commercial growing stock definition has changed and refers now to the total growing stock of all commercial species. |
| T 7 Biomass stock | No changes |
| T 8 Carbon stock | No changes |
| T 9 Forest fires | New table, reporting on number of fires and area annually affected. For forest fires, also a split into wildfire and prescribed fire |
| T 10 Disturbances affecting health and vitality | Fire moved to a separate table<br>Other disturbances split into biotic and abiotic factors<br>New sub-table specifying biotic disturbances<br>New sub-table on invasive species |
| T 11 Wood removals | Quantity and value merged into one reporting tables |
| T 12 Non-wood forest products removal and value of removal | Table completely redesigned. Reporting on the 10 most important NWPFs in terms of removed quantity and value. Only one reporting year (2005) |
| T 13 Employment in forestry | Small modifications of categories and definitions |
| T 14 Policy and legal framework related to forests and forestry | New table |
| T 15 Institutional framework related to forests and forestry | New table |
| T 16 Education and research related to forests and forestry | New table |
| T 17 Public expenditures related to forests and forestry | New table |

**Source:** What's new in the FRA 2010 reporting tables?

# *Appendix 4 - Participants' evaluation of the workshop*

18 responses out of the 24 participants (70.8 %)

1. Achievement of workshop objectives
   - ➢ Perfectly achieved 35.3 %
   - ➢ Fairly achieved   64.7 %
   - • Suggestions
     - More collaboration/networking are needed for further development (7 persons/41.2 %)
     - The forestry administration needs to endorse the MAR policy (1 person)

2. Content of the workshop
   - ➢ Very satisfied   47.1 %
   - ➢ Fairly satisfied  47.1 %
   - ➢ Unknown    5.9 %
   - • Suggestions
     - Presentations should be reduced and shortened (7 persons/41.2 %)
     - Some presentations need to be made clearer and more attractive(2 persons)
     - It was too fast to absorb a lot of subjects (1 person)
     - Local input into presentations is required (1 person)
     - Presentations should be oriented more to the Pacific region. (1 person)

3. Useful subjects/sessions for the participants

| Rank | Useful sessions | Presenter | Score |
|---|---|---|---|
| 1 | NFA-Philippines | Carlo S. Consolacion | 21 |
| 2 | Vegetation mapping using RS/GIS in Pacific Islands | Wolf O. Forstreuter | 18 |
| 2 | NFI methodology | Masahiro Otsuka | 18 |
| 3 | Remote sensing/GIS (general) | Kailash C. Govil, Masahiro Otsuka | 14 |
| 4 | Introduction to the MAR-SFM Project | Kailash C. Govil, Masahiro Otsuka | 11 |
| 5 | Regional collaboration | Masahiro Otsuka, Kailash Govil, participants (discussion) | 9 |
| 6 | International reporting | Masahiro Otsuka | 7 |
| 7 | Country experience | Robert M. McWilliam, Rexon Viranamangga, Vitus B. Ambia, Ioane Ubaitoi, Jimmy I. Wanefaia | 6 |
| 8 | FRA | Kailash C. Govil | 4 |
| 8 | Biomass/carbon | Masahiro Otsuka | 4 |
| 9 | Use of NFI | Masahiro Otsuka | 3 |
| 9 | GEF | Kailash C. Govil | 3 |
| 9 | Other background presentation (FAOSAPA, SPC, GTZ) | Aru J. Mathias, Sairusi Bulai, Streil Markus | 3 |
| 10 | Biodiversity | Masahiro Otsuka | 1 |
| 10 | Database management | Masahiro Otsuka | 1 |

- • Scoring method:

Total score = 3 x $S_1$ + 2 x $S_2$ + $S_3$

Where:

$S_1$: Frequency of a particular session considered the most useful

$S_2$: Frequency of a particular session considered the second most useful

$S_3$: Frequency of a particular session considered the third most useful

4. Organization of the workshop (agenda/program)
- ➢ Very satisfied    58.8 %
- ➢ Fairly satisfied  41.2 %
- • Suggestions
  - - A one-day field visit is desirable (2 persons)
  - - More time should be allocated for discussions and formulation of recommendations (1 person)
  - - Chairpersons should be nominated among resource persons/organizers (1 person) or all participants (1 person)?

5. Period (days) of the workshop
- ➢ Very satisfied    58.8 %
- ➢ Fairly satisfied  35.3 %
- ➢ Unknown    5.9 %
- • Suggestions
  - - The period was too short (1 person)
  - - There was no time to visit around Nadi (1 person)

6. Venue of the workshop (Tanoa International Hotel)
- ➢ Very satisfied    88.2 %
- ➢ Fairly satisfied  11.8 %
- • Suggestions
  Microphones/computers of the hotel should be improved (1 person)

7. Preparations/arrangements before the workshop
- ➢ Very satisfied    88.2 %
- ➢ Fairly satisfied  11.8 %

8. Recommended programs after this workshop
- ➢ National/regional networking (meetings, internet, e-mail, etc.) (10 persons)
- ➢ Follow-up MAR workshops (NFI, RS/GIS, international reporting, FRA, GEF, harmonization, action plan, etc.) (10 persons)
- ➢ Field trip to remote sensing site(s) (1 person)
- ➢ Study tour to neighboring countries (1 person)
- ➢ Development of the MAR Website (1 person)

9. Other suggestions/comments
- ➢ Presentation on forest canopy density mapping should be added (1 person)
- ➢ Information exchange should be started among the countries for long-term development of MAR-SFM (1 person)
- ➢ It is desirable that one more person is invited to the workshop from the inventory/mapping section of each country (1 person)
- ➢ The SPC should be the focal point of the regional network for better ownership (2 persons)
- ➢ Collaboration with SPC for workshop organization was a good idea (1 person)

10 Overall rating of this workshop
- ➢ Very good    52.9 %
- ➢ Fairly good  47.1 %