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Your contribution of short articles on Forest MAR (1-2 pages) will be highly welcomed.

Activities:

National MAR workshop in India

- The Forest Research Institute (FRI) organized a national workshop on forest MAR with central and regional officers in Dehradun during 22 - 23 April 2009, focusing on the national Criteria and Indicator (C&I) system to enhance sustainable forest management (SFM). Participants presented and discussed an overall C&I framework, monitoring methodologies, institutional capacities for application of C&I and experience in C&I testing in six states.



National MAR workshop in Dehradun
Credit: Masahiro Otsuka

- Participants made the following recommendations on better application of C&I in India: (i) Outcomes of pilot studies on national C&I in six states should be shared with other states for its finalization and implementation in the country; (ii) It is necessary to supplement knowledge of forest inventory, including sampling techniques, statistical packages, computer sciences, etc., in order to provide better data using C&I; (iii) Skill development is required for periodical surveys on flora and fauna, socio-economic variables, fire, and pests at the local level, assisted by thematic experts. Participatory approaches could also facilitate data collection for specific indicators such as biodiversity; (iv) Estimation of unrecorded removals from forests should be further strengthened in collaboration with local stakeholders; (v) Geoinformatics with remote sensing/GIS and GPS should also be strengthened to ensure more vigorous and precise data collection and mapping with C&I at the field level; (vi) Building on C&I data, forest management plans and guidelines (e.g. forest management codes) should be developed to enhance SFM; (vii) The Government of India should facilitate strengthening of institutional capacities with proper staff and budget for successful implementation of forest MAR and SFM in the country; and (viii) The National Network should be further strengthened with various participants, accompanied by a website for easier information sharing.
- The C&I approach highlights a need for optimal utilization of forestry resources to ensure sustained flow of goods and services for present and future generations. Sustainable Forest Management (SFM) Cells were constituted as nodal bodies for policy matters in the Ministry of Environment and Forests and State Forest Departments, dealing with C&I. During the second meeting of the SFM Cell in March 2008, 8 criteria and 37 indicators were finalized on the basis of initial C&I testing in the field.
- The Forest Survey of India (FSI) regularly provides data on forest cover using LISS III with intensive ground truthing. The FSI also carries out thematic studies such as inventory of trees outside forests and non-wood forest products (NWFP), demarcation of forest boundary with differential GPS and application of geomatics to prepare working plans. The six states have collected benchmark data for the C&I framework at the field management unit (FMU) level to testify its feasibility. As a whole, FMU officers require training for effective application of C&I.
- The MAR Project will consider follow-up collaboration after the national MAR workshop, such as: (i) pilot testing in some other states in different ecological and socio-economic conditions; and (ii) development of a sub-regional MAR network in collaboration with the South Asian Association for Regional Cooperation (SAARC) Forestry Centre to mutually support MAR among countries, while disseminating and harmonizing national C&I frameworks in South Asia.



Botanical garden in Dehradun
Credit: Masahiro Otsuka

International NFI workshop in India

- FAO convened an International Workshop on National Forest Inventory (NFI) : The Experiences of Non-Annex I Countries with participants from Asia, Africa, and Latin America at the International Council of Forestry Research and Education (ICFRE) in Dehradun during 27 – 29 April 2009 in collaboration with GTZ, Federal Ministry for the Environment, Nature and Conservation and Nuclear Safety, UNDP, UNEP, and Coalition for Rainforest Nations. The workshop introduced a scheme of monitoring on REDD (Reducing Emissions from Deforestation and Degradation), including the Subsidiary Body for Scientific and Technological Advice (SBSTA) - 29 guidelines, IPCC guidelines for biomass and carbon measurement, and the scope of monitoring, assessment, reporting and verification (MARV). The MARV is comprised of support for data collection, assistance in national monitoring systems, training, and development of independent review systems with joint roster of experts in collaboration with the UNFCCC, IPCC, other international processes/organizations, and national organizations. Improvement of NFIs and their sampling designs will be considered for effective carbon measurement, while keeping some flexibility in methodological development in each country.



International NFI workshop, Dehradun
Credit: Masahiro Otsuka

- Participants visited Sal (*Shorea robusta*) forests in Lachchhiwala. Experts of the Forest Survey of India, ICFRE, and Indian Institute of Remote Sensing (IIRS) made a demonstration on physical and procedural details of observations and measurements for forest carbon accounting, comprising estimation of biomass carbon and soil organic carbon.
- FAO made presentations on schemes and cases of National Forest Monitoring and Assessment (NFMA) and their costs and time frame as well as activities under the MAR Project. Listening to experiences of pilot countries (e.g. Nicaragua, Kenya, and Zambia), several countries showed keen interest in collaboration with FAO to testify the NFMA approach for improving

national data collection systems. Representatives from India, Malaysia, China, and Mexico presented their approaches to forest inventory and assessment of forest carbon stock. These presentations showed diverse approaches to national forest monitoring and assessment, posing discussions on their harmonization. Participants learned their institutional and technical capacities to collect data in the field with national and local stakeholders, whereas discussing how to harmonize different technical approaches for coherent forest and carbon monitoring. Different plot design and data collection techniques will be evaluated in monitoring activities under the REDD-MARV.



Field demonstration on measurement of forest carbon stock
Credit: Masahiro Otsuka

- Panellists and participants discussed issues to strengthen REDD monitoring with NFI. It is crucial to develop a cost-effective monitoring mechanism by enhancing NFI and other analytical work to facilitate readiness for REDD monitoring in countries. It is also important to ensure countries' easier access to low-cost remote sensing data. REDD is expected to promote rapid technical transfer to countries for their easier shifting from Tier 1 to Tiers 2/3 in the IPCC methodology. Then there is a need for training to countries for improved reporting to UNFCCC. Through these activities, FAO would take the lead initiative for capacity building in REDD monitoring. Moreover, experienced countries (e.g., India, China, Mexico, Brazil, etc.) could provide their knowledge and skills to other countries for effective information sharing. Countries' experiences and activities will need to be learned more carefully for future development of REDD-MARV.
- Information on the workshop is available at the ICFRE site at <http://www.icfre.org/> (in the column of Bulletin Board).

Regional ASEAN C&I training workshop in Malaysia

The ASEAN C&I training workshop was convened in Kuala Lumpur during 5 - 7 May to review the status of countries' application of MAR formats, introduce the developed ASEAN C&I framework and its online format to participants, and receive their feedback for further improvement. A presentation was made on analysis of questionnaires with ASEAN member states regarding the status of MAR application. It suggested an urgent necessity for institutional strengthening and capacity building to provide information on non-wood forest products (NWFPs), forest carbon stock, and endangered forest-dependent species as well as to adjust classification of protected forest areas to the IUCN Protected Area Management Categories in member states. More effective inter-agency coordination will be required to collect data for developed indicators. It is suggested that the whole set of criteria and indicators be used as an integral system to assess sustainable forest management (SFM) at both national and forest management unit (FMU) levels.



Field trip in the Bukit Lagong Forest Reserve, Selangor
Credit: Forest Research Institute of Malaysia

Participants of nine countries presented progress and challenges in forest MAR. They pointed out limited capacities of FMU for data collection using C&I, lack of stakeholders' interest in MAR activities, difficulties in data collection for specific indicators (e.g., carbon stock, etc.), discrepancies in data formats among different data sources, and a need for translation of online formats into local languages. It is crucial to develop human resources in member states by disseminating online MAR systems to national and local stakeholders.

Participants generally suggested improvement of the MAR online system with ASEAN C&I, such as: (a) Further clarification of footnotes with enough texts; (b) Revision of texts by correcting spelling errors; (c) Use of decimals for numeric columns; (d) Inclusion of boxes for remarks with scroll functions for most tables; (e) Different coding in columns for indicators which are not applicable in countries and those which are applicable but not feasible due to lack of information; and (e) resolution of a syntax error problem by which a system no longer allows further editing of indi-

cators, when "0" is accidentally inserted and saved for some of the tables.

Workshop organizers and participants discussed recommendations for further development of MAR with C&I in the ASEAN region: (a) assessment of an adequate indicator set which is relevant to the national and FMU levels in each country; (b) organization of follow-up training for trainers and technical officers at regional, national and FMU levels; (c) research in assessment of forest-dependent flora and fauna as well as endangered/rare species, quantification of NWFPs, and valuation of forest ecosystem services with sufficient funds; (d) effective coordination for inter- and intra-agency collaboration, especially to provide information for indicators at a national level; (e) development of appropriate and cost-effective tools to obtain temporal and spatial data for indicators, including remote sensing and GIS technologies; (f) inclusion of some critical variables for a future C&I framework, such as planted forest, resource ownership and use rights, and role of forest in climate change mitigation and adaptation; (g) preparation of the C&I format in local languages to enhance its implementation in countries; (h) facilitation by the ASEAN Secretariat in sharing of experiences among member states to implement a clearing house mechanism (CHM) using the C&I format; and (i) development of networking with other international organizations through ASEAN, covering their reporting tools, to encourage harmonization of forest-related reporting with C&I.

It is expected that the ASEAN Secretariat will periodically produce a synthesis report on progress in application of the C&I format in member states to review and enhance the CHM with C&I for SFM in the Southeast Asian region. A full workshop report is available at: [http://info.frim.gov.my/cfdocs/infocenter/upload/file/Report-Regional Workshop on MAR-Format-25May09v43.doc](http://info.frim.gov.my/cfdocs/infocenter/upload/file/Report-Regional%20Workshop%20on%20MAR-Format-25May09v43.doc)



Demonstration of tree marking by the Forestry Department Peninsular Malaysia in the Forest Reserve
Credit: Forest Research Institute of Malaysia



Events

Conferences

🔗 Technical meeting of the Remote Sensing Survey – FRA2010

🌐 A technical meeting of the Remote Sensing Survey Task Force for the Global Forest Resources Assessment (FRA) 2010 (<http://www.fao.org/forestry/55919/en/>) was held at the FAO-Headquarters in Rome, 30 March – 3 April 2009 to provide an overview of the FRA 2010 Remote Sensing Survey (RSS) methods, train country representatives for pilot studies for the RSS on remote sensing processing software, and seek feedback from countries on the RSS through detailed hands-on testing. Over 40 participants attended the meeting from 22 countries.

🌐 Presentations by partners introduced methodologies which are being used to help countries participate in the RSS. Sessions included land-cover and land-use legends. Hands-on training was provided in remote sensing software provided by FAO. Countries in the Task Force are testing the methods up to 400 pilot study sites around the world to evaluate their applicability.

🌐 Countries participating in the FRA2010 RSS Pilot Study were better informed on the work involved and provided with training in using the systems and software to process sample images within their countries. These countries will provide feedback to FAO and RSS partners on the methods to enable improvements in future work with other countries.

🔗 GEO Forest Monitoring Symposium

🌐 The first forest monitoring symposium of the Group on Earth Observations (GEO) (<http://www.earthobservations.org/>) was convened in Foz do Iguaçu, Brazil, 4 – 7 November 2008 (<http://www.dpi.inpe.br/geoforest/>). Its objective was to link existing and planned forest observation systems around the world, identify new systems where gaps existed, and improve access to and use of in-situ, aerial and satellite earth observations.

🌐 The symposium concluded that considerable additional efforts would be required to improve forest monitoring by enhancing open-data policies despite strong capabilities of existing products. Collection of radar data in specified areas with high cloud frequencies to compliment optical data is specifically important.

🌐 Future enhancement in forest monitoring can be achieved through development of LIDAR, radar and thermal and capabilities to fill a critical gap in data on height and structure of vegetation, biomass, and biodiversity, leading to improved carbon estimation and characterization of forest degradation. Hyperspectral sensing will improve monitoring of invasive species, forest health and ecosystem services.

🌐 The symposium recommended improved use of data sets and derived products by adopting standards for all spatial data sets through strengthening of capacity building to developing countries for better data accessibility. GEO standards will need to be further elaborated on data formats, meta-data standards, and data and system interoperability. For long-term and effective operational observation systems, the symposium supports the Land Surface Imaging Virtual Constellation which is being developed by the Committee on Earth Observing Systems (CEOS).

🌐 The second forest monitoring symposium of GEO will be convened in Chiang Rai, Thailand during 1 – 3 July 2009 (<http://conference.gistda.or.th/2ndgeoforest/>).

Products (software)

🔗 Land Cover Classification System (LCCS) 3

🌐 A classification process of the Land Cover Classification System Ver.3 (Land Cover Meta Language, LCML) (http://www.glcn.org/ont_2_en.jsp) design criteria aims at structuring a specific knowledge domain to create consistency and stability in communication between individuals. The LCML is an attempt to classify "real world features" (specifically land-cover features) with very simple groups of elements arranged in different ways that act as building blocks to describe more complex semantics in any separate application ontology (legends).

🌐 The LCML works as "boundary object" to mediate and support negotiations of different ways to represent land cover around which similarities and differences can be understood and expressed. The LCML can be customized to user requirements, while maintaining common identities between users. The LCML is characterized by: (i) essential elements of a language to balance the goal of global standardization of land-cover terms with a need for detailed land-cover descriptions to ensure practical applicability; (ii) maximal reduction of complex descriptions and definitions; and (iii) a predefined set of basic land-cover elements enriched on their semantic significance with external qualities and attributes and arranged in different types of strata to describe a wide variety of distinctive and detailed land-cover situations.

🔗 MAD-CAT

🌐 Mapping Device–Change Analysis Tool (MAD-CAT, http://www.glcn.org/sof_5_en.jsp) is stand-alone software that combines two different, but fully integrated sets of functions, such as: (i) land-cover mapping support which allows users to generate vector-based land-cover datasets using different interpretation techniques; and (ii) detection and validation of land-cover changes on statistical basis. The software is directly linked with LCCS and it is able to manage LCCS classes and LCCS cartographic standards.

