Task Implementation Plan, organizational framework and progress

Giovanni Rum
GEO Secretariat

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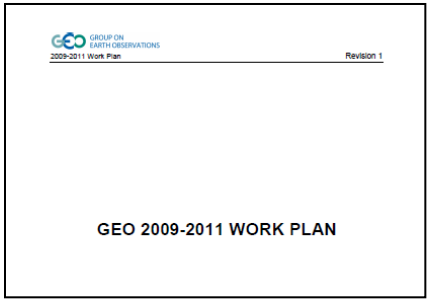
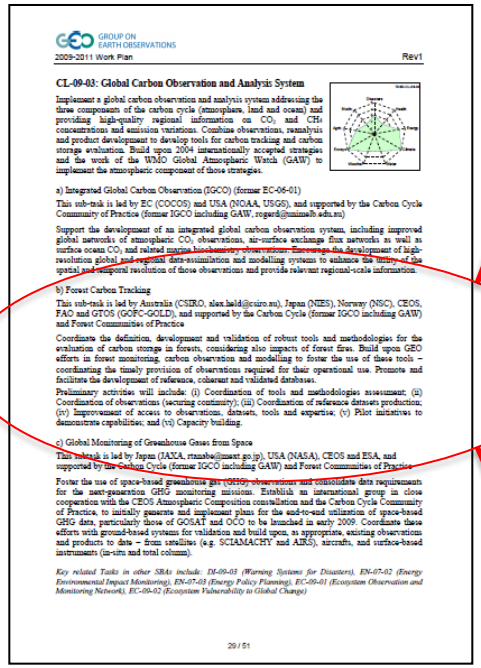
From the GEO Workplan to the detailed Task Sheet

GEO Workplan → Overarching task → Detailed task sheet


GEO GROUP ON EARTH OBSERVATIONS
2009-2011 Work Plan Revision 1

GEO 2009-2011 WORK PLAN


GEO GROUP ON EARTH OBSERVATIONS
2009-2011 Work Plan Rev1

CL-09-03: Global Carbon Observation and Analysis System

Implement a global carbon observation and analysis system addressing the three components of the carbon cycle (atmosphere, land and ocean) and providing high-quality regional information on CO_2 and CH_4 concentrations and emission variations. Combine observations, reanalysis and product development to develop tools for carbon tracking and carbon storage evaluation. Build upon 2004 internationally accepted strategies and the work of the WMO Global Atmospheric Watch (GAW) to implement the atmospheric component of those strategies.

a) Integrated Global Carbon Observation (IGCO) (former EC-06-01)

This sub-task is led by EC (COCOS) and USA (NOAA, USGS), and supported by the Carbon Cycle Community of Practice (former IGCO including GAW, rogerd@naimsb-sdu.eu)

Support the development of an integrated global carbon observation system, including improved global networks of atmospheric CO_2 observations, air-surface exchange flux networks as well as surface ocean CO_2 and related marine biochemistry observations. Encourage the development of high-resolution global and regional data-assimilation and modelling systems to enhance the fidelity of the spatial and temporal resolution of those observations and provide relevant regional-scale information.

b) Forest Carbon Tracking

This sub-task is led by Australia (CSIRO, alex.held@csiro.au), Japan (NIES), Norway (NSC), CEOS, FAO and GTOS (GOFC-GOLD), and supported by the Carbon Cycle (former IGCO including GAW) and Forest Communities of Practice

Coordinate the definition, development and validation of robust tools and methodologies for the evaluation of carbon storage in forests, considering also impacts of forest fires. Build upon GEO efforts in forest monitoring, carbon observation and modelling to foster the use of these tools – coordinating the timely provision of observations required for their operational use. Promote and facilitate the development of reference, coherent and validated databases.

Preliminary activities will include: (i) Coordination of tools and methodologies assessment; (ii) Coordination of observations (securing continuity); (iii) Coordination of reference datasets production; (iv) Improvement of access to observations, datasets, tools and expertise; (v) Pilot initiatives to demonstrate capabilities; and (vi) Capacity building.

c) Global Monitoring of Greenhouse Gases from Space

This task is led by Japan (JAXA, rtsuzuki@mext.go.jp), USA (NASA), CEOS and ESA, and supported by the Carbon Cycle (former IGCO including GAW) and Forest Communities of Practice

Foster the use of space-based greenhouse gas (GHG) observations and consolidate data requirements for the next-generation GHG monitoring missions. Establish an international group in close cooperation with the CEOS Atmospheric Composition constellation and the Carbon Cycle Community of Practice, to initially generate and implement plans for the end-to-end utilization of space-based GHG data, particularly those of GOSAT and OCO to be launched in early 2009. Coordinate these efforts with ground-based systems for validation and build upon, as appropriate, existing observations and products to date – from satellites (e.g. SCIAMACHY and AIRS), aircrafts, and surface-based instruments (in-situ and total column).

Key related Tasks in other SBAs include: DI-09-03 (Warning Systems for Disasters), EN-07-02 (Energy Environmental Impact Monitoring), EN-07-03 (Energy Policy Planning), EC-09-01 (Ecosystem Observation and Monitoring Network), EC-09-02 (Ecosystem Vulnerability to Global Change)

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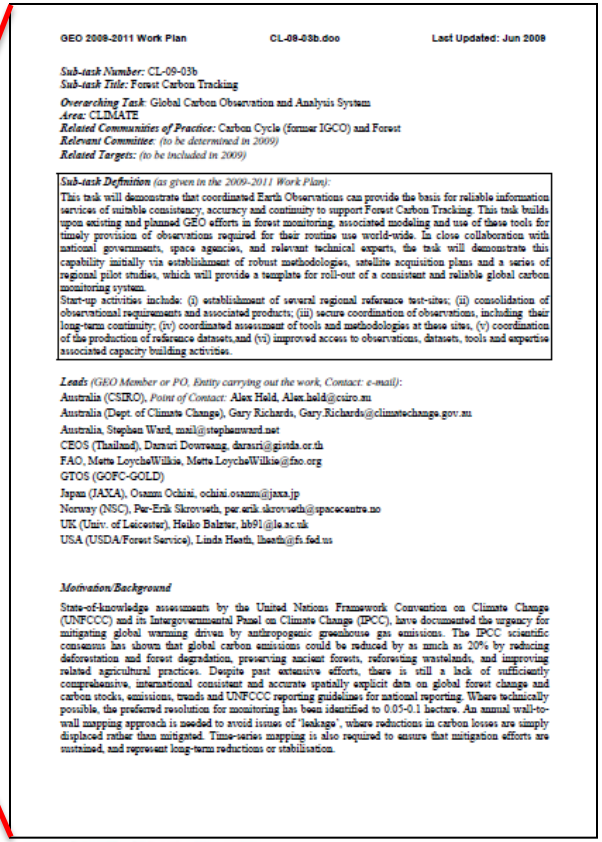

GEO 2009-2011 Work Plan **CL-09-03b.doc** **Last Updated: Jun 2009**

Sub-task Number: CL-09-03b
Sub-task Title: Forest Carbon Tracking
Overarching Task: Global Carbon Observation and Analysis System
Area: CLIMATE
Related Communities of Practice: Carbon Cycle (former IGCO) and Forest
Relevant Committee: *(to be determined in 2009)*
Related Targets: *(to be included in 2009)*

Sub-task Definition *(as given in the 2009-2011 Work Plan):*
This task will demonstrate that coordinated Earth Observations can provide the basis for reliable information services of suitable consistency, accuracy and continuity to support Forest Carbon Tracking. This task builds upon existing and planned GEO efforts in forest monitoring, associated modeling and use of these tools for timely provision of observations required for their routine use world-wide. In close collaboration with national governments, space agencies, and relevant technical experts, the task will demonstrate this capability initially via establishment of robust methodologies, satellite acquisition plans and a series of regional pilot studies, which will provide a template for roll-out of a consistent and reliable global carbon monitoring system.
Start-up activities include: (i) establishment of several regional reference test-sites; (ii) consolidation of observational requirements and associated products; (iii) secure coordination of observations, including their long-term continuity; (iv) coordinated assessment of tools and methodologies at these sites, (v) coordination of the production of reference datasets,and (vi) improved access to observations, datasets, tools and expertise associated capacity building activities.

Leads *(GEO Member or PO, Entity carrying out the work, Contact: e-mail):*
Australia (CSIRO), *Point of Contact:* Alex Held, Alex.held@csiro.au
Australia (Dept. of Climate Change), Gary Richards, Gary.Richards@climatechange.gov.au
Australia, Stephen Ward, mail@stephenward.net
CEOS (Thailand), Darasri Dowreung, darasri@gistda.or.th
FAO, Mette LoycheWilkie, Mette.LoycheWilkie@fao.org
GTOS (GOFC-GOLD)
Japan (JAXA), Osamu Ochiai, ochiai.osamu@jaxa.jp
Norway (NSC), Per-Erik Skrovseth, per.erik.skrovseth@spacecentre.no
UK (Univ. of Leicester), Heiko Balzter, hb91@le.ac.uk
USA (USDA/Forest Service), Linda Heath, lheath@fs.fed.us

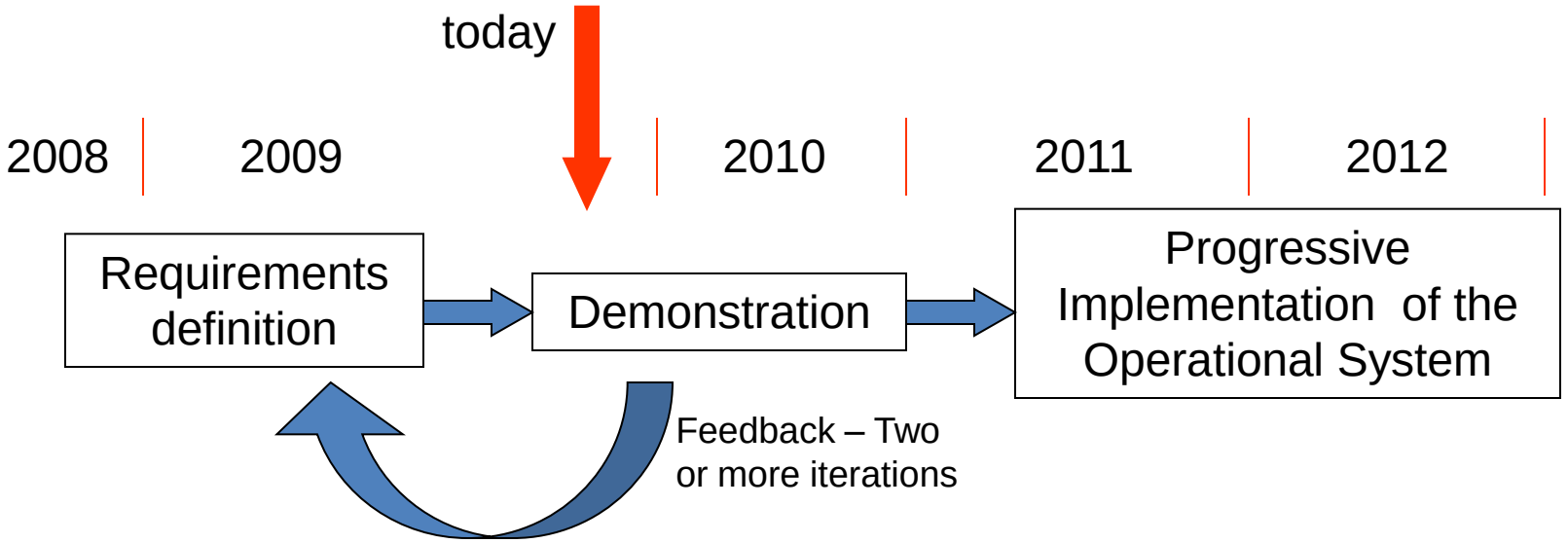
Motivation/Background

State-of-knowledge assessments by the United Nations Framework Convention on Climate Change (UNFCCC) and its Intergovernmental Panel on Climate Change (IPCC), have documented the urgency for mitigating global warming driven by anthropogenic greenhouse gas emissions. The IPCC scientific consensus has shown that global carbon emissions could be reduced by as much as 20% by reducing deforestation and forest degradation, preserving ancient forests, reforesting wastelands, and improving related agricultural practices. Despite past extensive efforts, there is still a lack of sufficiently comprehensive, international consistent and accurate spatially explicit data on global forest changes and carbon stocks, emissions, trends and UNFCCC reporting guidelines for national reporting. Where technically possible, the preferred resolution for monitoring has been identified to 0.05-0.1 hectare. An annual wall-to-wall mapping approach is needed to avoid issues of "leakage", where reductions in carbon losses are simply displaced rather than mitigated. Time-series mapping is also required to ensure that mitigation efforts are sustained, and represent long-term reductions or stabilisation.

Task Implementation Plan
Work Packages

- **WP0000: TASK COMMUNICATION PLAN**
- **WP1000: DEFINE SATELLITE DATA NEEDS AND SECURE CONTINUITY**
- **WP2000: DEFINE AND ESTABLISH NATIONAL DEMOSTRATORS**
- **WP4000: LINKAGE WITH ECOSYSTEM MODELS AND FOREST INVENTORIES**
- **WP5000: DESIGN & DEMONSTRATE OPERATIONAL FOREST CARBON TRACKING SYSTEM**
- **WP6000: GEO-VI and COP-15**

Task Implementation phases



The selected approach allows progressive inclusion of additional National Demonstrators into subsequent demonstration cycles and a smooth transition to a pre-operational and then to an operational system

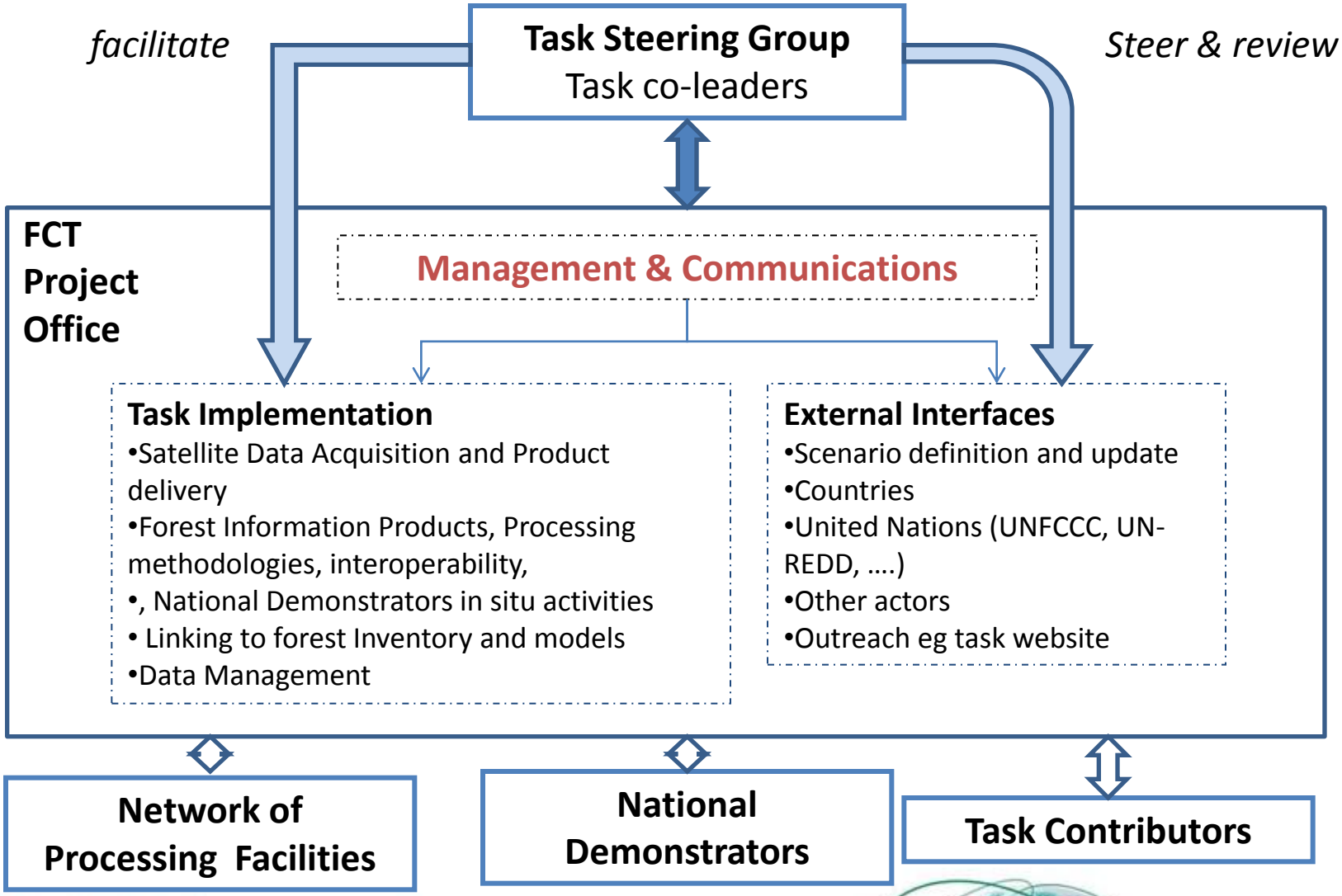
Task Definition Documents

System Definition Documents
FCT Concept and Implementation Strategy
FCT Summary description
FCT Data Management & Access Guidelines for National Demonstrators
FCT Guidance on National Demonstrator activities, benefits and responsibilities
Design Documents
FCT Products Requirements
FCT Satellite Interoperability and processing methods
FCT Processing Hubs Network for the Demonstration phase – Terms of Reference
FCT Guidelines for in-situ data and observations at Verification sites
FCT Ground Measurements, Inventory and Model Calibration/Validation

FCT 2009 demonstration Documents

2009 Demonstration
FCT 2009 CEOS Satellite Data Requirements for National Demonstrators
FCT 2009 Commercial Satellite Data Requirements for National Demonstrators
FCT 2009 Demonstration: observation, processing and Validation plan
FCT 2009 Demonstration Portal Requirements and Description
FCT 2009 Demonstration Report and Feedback

Task organizational arrangement



National Demonstrators

The Task has established a number of reference demonstration areas, “National Demonstrators”, for developing and testing approaches and methods and demonstrating the use of current Earth observation capabilities for assessing long-term, operational forest-cover change and carbon monitoring.

National Demonstrators are defined as areas large enough to demonstrate the wall-to-wall capability and to contain several verification sites, where the in situ/aerial measurement will take place and higher resolution/higher temporal frequency satellite data will be acquired.

The verification sites, as they are currently defined, will serve:

- As a “classical” Calibration/Validation sites for the moderate resolution information products
- As “intensive observational sites” where higher resolution/higher temporal frequency satellite data will be acquired.

Progress to date

- The project Implementation Plan, including country and organisation commitments, has been approved and initiated;
- The National Demonstrators process has been consolidated, National Demonstrators have been defined and activities have been initiated;
- A Document on Satellite Optical/ SAR Data Requirements and systematic acquisitions strategies has been released (June 2009);

National Demonstrators location

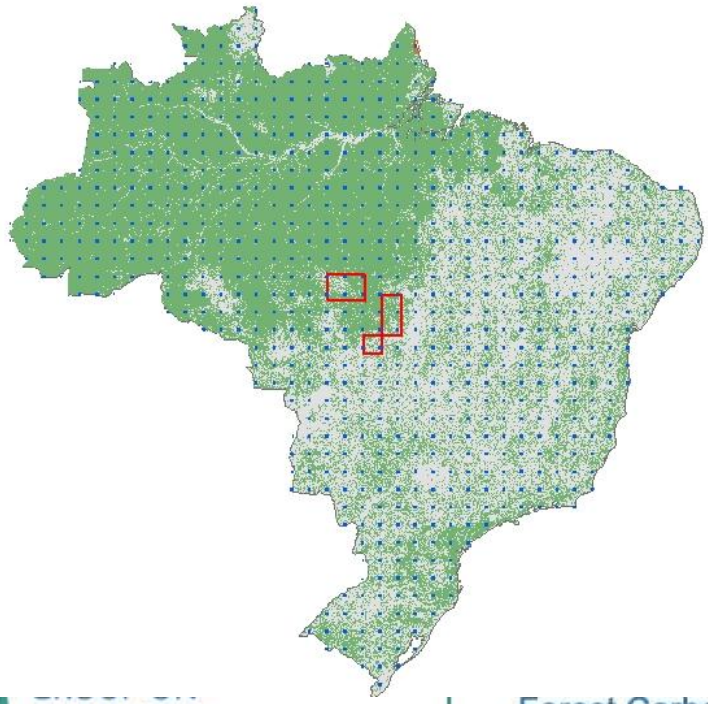
National Demonstrators

Mexico
500.000

Out of
1.970.000

Indonesia
(Borneo)
743.000

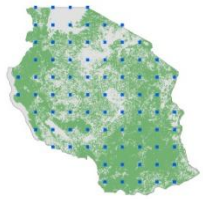
Australia
(Tasmania)
68.000



Brazil
1.400.000

Out of
8.500.000

Cameroon
475.000



Tanzania
945.000

Guyana
215.000

Progress to date

- Satellite data are being acquired over the National Demonstrators, starting from June 2009;
- Satellite Data Processing mechanisms have been established (Network of Processing Facilities) and data processing has started;

Progress to date

- Three key documents are being finalized for release in October 2009:
  - Field Measurement guidelines and protocols;
  - Accuracy assessment and verification;
  - Data and model linking and visualisation.
- A number of Technical workshops have been held, in Brazil November ‘08, Australia April ‘09, Italy May ‘09, Thailand July ‘09 and Japan August ’09.

Back-up charts

WP0000: TASK COMMUNICATION PLAN

- WP0100: Task Plan and Milestone Management
- WP0200: Internal Team Telecon Schedule and Planning
- WP0300: Task Contacts, Communications and Outreach

WP1000: DEFINE SATELLITE DATA NEEDS AND SECURE CONTINUITY

- WP1100: Secure a CEOS resolution on Forest Carbon data supply from SIT-23
- WP1200: Define satellite data requirements and supporting acquisition strategies
- WP1300: Secure data commitments from key sources for 2009 outcomes and beyond
- WP1400:Linkage with LSI to ensure continuity of optical data
- WP1500: Define a data archive and storage strategy

WP2000: DEFINE AND ESTABLISH NATIONAL DEMOSTRATORS

- WP2100: Define National Demonstrators
- WP2200: Establish National Demonstrator relationships
- WP2300: 2nd GEO Forest Symposium

WP3000: DEFINE DEFINE DATA PRODUCTS AND DATA INTEROPERABILITY METHODS

- WP3100: Development of remote sensing product standards for forest monitoring and linkage to ecosystem-carbon models
- WP3110: Expert Workshop on Data Products and Interoperability
- WP3200: Data Interoperability Methods Document

WP4000: LINKAGE WITH ECOSYSTEM MODELS AND FOREST INVENTORIES

- WP4100: Define specifications for ground verification and reference datasets required
- WP4200: Initiate assembly of input spatial data layers needed by ecosystem models and carbon accounting systems
- WP4300: Establish field-validation programs in Demonstrator countries
- WP4400: Monitor and undertake current research on remote sensing of forest dynamics and structure

WP5000: DESIGN & DEMONSTRATE OPERATIONAL FOREST CARBON TRACKING SYSTEM

WP6000: GEO-VI and COP-15

- WP6100: Define SBSTA-30 Objectives
- WP6200: Define COP-15 Objectives
- WP6300: Define GEO-VI Objectives
- WP6400: Develop Presentations and Statements
- WP6500: Develop Visualisations