

Workshop FOR-X R&D Project by Remote Sensing Solutions GmbH and Infoterra GmbH

Hosted by: National Standardization Agency of Indonesia (BSN)
Organized by: Center for International Forestry Research (CIFOR)
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Spatial Planning and New Remote Sensing Technologies to Support REDD Implementation in Indonesia

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Background

Reducing Emissions from Deforestation and forest Degradation (REDD) is highly regarded as one of the important measures to combat climate change. It is also economically interesting since one-fifth of man-made CO₂ emissions are originated from deforestation. Indonesia with around 60% forest land cover has a very high interest to implement and benefit from REDD mechanisms due to high rates of deforestation and forest degradation.

The challenges remain how the scheme would be governed to effectively reduce GHG emissions and implemented in cost-efficient manner to maximize the benefit that should be distributed equitably. A top-down fashion implemented in many projects should be balanced with a bottom-up approach by ensuring a wide participation of stakeholders.

Since national approach will be used in monitoring, reporting, and verifying (MRV) carbon benefits, spatial information is one of the key issues in REDD process. It is not clear, however, how the national database is developed, maintained and shared. Land-use and spatial planning becomes more important to increase the capacity of countries to capture the benefits. MRV requires agreement on standards that comply with relevant UNFCCC Methodologies and IPCC Guidelines.

The advancement in remote sensing technology poses another challenge to be able to accurately monitor changes in land-use and the associated carbon stocks. Nowadays, there is a huge variety of airborne and space-borne sensors available observing the Earth ranging from visible to microwave, at spatial resolutions ranging from sub-meter to kilometers and temporal frequencies ranging from minutes to months. Each system having its advantages and disadvantages in regard to the REDD monitoring tasks.

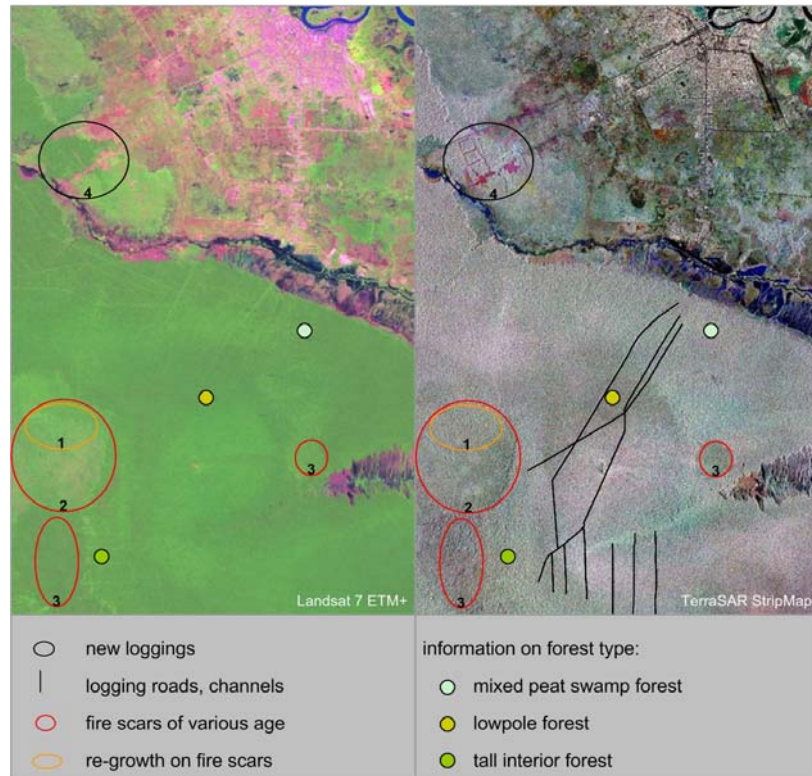
The workshop will explore national level spatial data acquisition and their application in spatial planning. The linkages between forest resource information system that leads to carbon accounting will be further examine possible REDD implementation at sub-national level. While at "project" level focus will be given to SAR systems in general and the possibilities of the new German TerraSAR-X satellite.

A specific objective is therefore, to present TerraSAR-X example results of the R&D project FOR-X funded by the German Aerospace Center. The project focuses on exploring the potential of the new TerraSAR-X satellite in the context of tropical forest monitoring, current REDD monitoring tasks and the combination possibilities with other operational remote sensing systems. The investigation area is located in Central Kalimantan, Indonesia. The region is characterized by a flat topography and large areas of peat swamp forests.

The workshop will be attended by around 30 participants representing policy makers, practitioners, academia, and civil society having interests in REDD scheme in general and remote sensing in particular. It is expected that the participants will be able to meet their expectation by combining the political and technical issues around REDD and remote sensing technologies. This should be possible since the workshop will provide the opportunity to work in groups in addition to presentations and discussions of the issues.

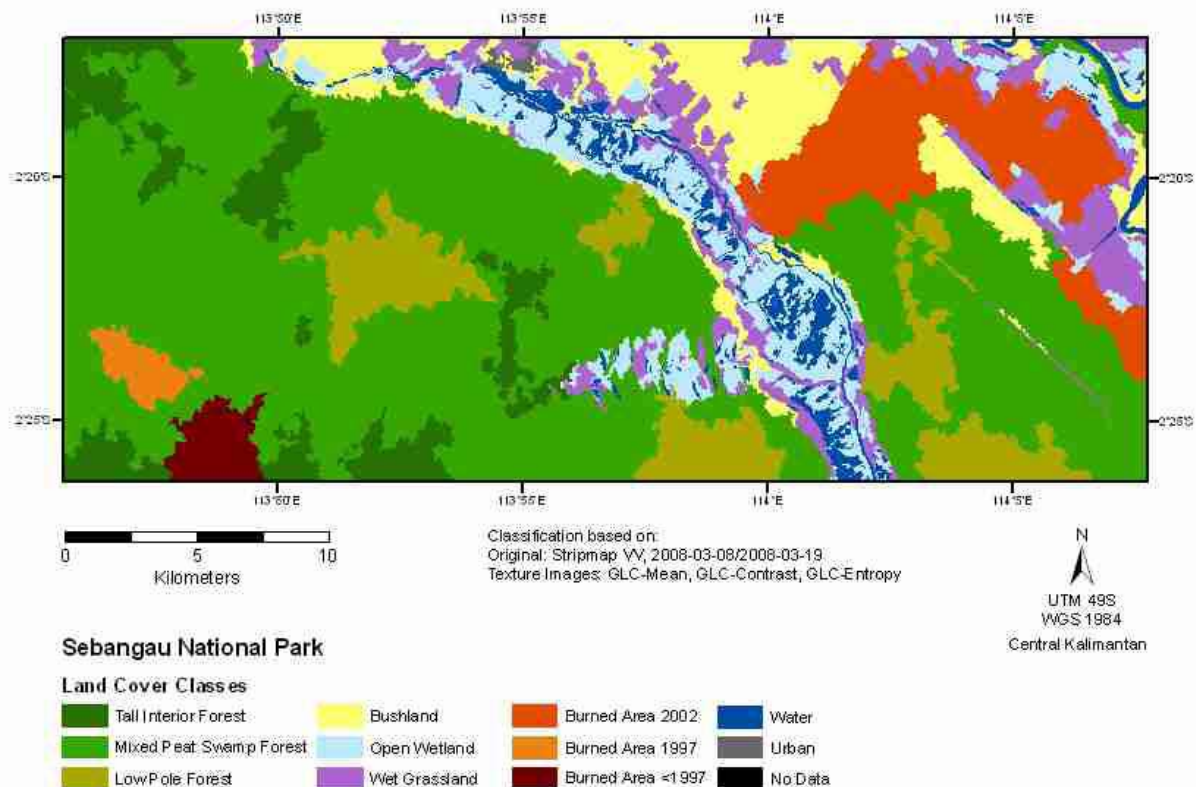
Technical information on TerraSAR-X

A first impression of the TerraSAR-X image content and the separability of the different forest classes and degradation levels is shown below, illustrating the information content of a multi-temporal TerraSAR-X StripMap composite compared to Landsat 7 ETM in terms of forest degradation and types.



TerraSAR-X in comparison to Landsat delivers comparable information content on fire scars which have not been regenerated yet (2) and on areas of re-growth (1). TerraSAR-X delivers improved information content on small scale logging roads or canals (not visible in Landsat) and shows old fire scars hardly or not visible in Landsat (3). TerraSAR's high repetition rate enables frequent and up to date detection of deforestation and degradation (4). The described information content can be exploited in visual and automatic information extraction. First tests have been performed concerning the differentiation of forest types and degradation.

Overall the generalized conclusions of the project are, that the new TerraSAR-X satellite is very suitable to complement other SAR (ALOS-PALSAR) and other sensors (optical or LIDAR) in terms of timely data supply for change detection, to improve the quality of derived forest maps in terms of localization and mapping accuracy, spatial and temporal resolution but also for more detailed mapping on forest types, forest biomass and degradation.



Detailed classification results for a StripMap VV image.

Considering operational aspects of a forest monitoring system TerraSAR-X exhibits important advantages:

- Reliable large area coverage (weather independent; reliable commercial programming, processing, delivery service).
- High resolution allows to detect small logging roads and skid trails indicating logging activities
- The flexibility of imaging mode (SpotLight, StripMap, ScanSAR) resolutions ranging from 1 – 18 m allows to find the best trade-off between coverage, resolution and information content (choice of polarisation in single or dual polarisation mode)
- Fast access time and high repetition rate in case of disaster monitoring (forest fire)
- Service continuity (of particular importance for monitoring systems) through TanDEM-X and TerraSAR-X2

Workshop Program

Time	Topic	Responsible
08.00-09.00	Registration	
09.00-09.30	Opening remarks: BSN and the National carbon standard in Indonesia	B. Setiadi (BSN)
09.30 – 10.00	REDD – current status <ul style="list-style-type: none"> • Political issues • Methodological issues • Financial issues • What to expect from Copenhagen? 	D. Murdiyarso (CIFOR)
10.00– 10.30	Coffee break	
10.30 – 12.00	Panel on Spatial planning and REDD implementation in Indonesia <ul style="list-style-type: none"> • Policy processes on spatial planning and the implications for REDD • The application of earth system remote sensing for spatial planning • Harmonizing regional spatial planning and forest land-uses • The development of INCAS and FRIS 	Chair: D. Murdiyarso (CIFOR) Panelists: • Min. Public Works • LAPAN • Min. of Home Affairs • Min. of Forestry
12.00 – 13.00	Lunch break	
13.00 – 13.45	Use of optical, SAR and LIDAR systems for operational REDD monitoring <ul style="list-style-type: none"> • RSS GmbH: Company experience Overview of recent remote sensing technologies for forest monitoring and REDD 	F. Siegert (RSS GmbH)
13.45 – 14.30	Use of SAR data (TerraSAR-X; PaISAR) in the context of REDD <ul style="list-style-type: none"> • Infoterra: Company experience • The potential of the new TerraSARX radar satellite system for REDD <p>REDD Scheme of the Japanese Government/Companies and Project Evaluation Utilizing TerraSAR-X Data</p>	F. v. Poncet (Infoterra GmbH) Co-speaker: T. Sasagawa (Pasco Corporation)
14.30 – 15.00	Coffee break	
15.00 – 16.30	Parallel Working Groups	
	Working Group 1 - F. Siegert <ul style="list-style-type: none"> • Discussion on remote sensing technologies for REDD • Discussion on requirements for Baseline assessment and monitoring for Indonesia • Special case: tropical peatlands • Field data collection 	Working Group 2 - D. Murdiyarso <ul style="list-style-type: none"> • How would INCAS and FRIS be operationalized in the context of sub-national REDD activities • How would regional and local spatial planning could benefit from centralized database and platform
16.30 – 17.00	Concluding discussion and Wrap-up	D. Murdiyarso (CIFOR) F. Siegert (RSS GmbH)