

Linking the national to the local

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Key assumptions

1. REDD+ is a national process (policy and performance) but needs to work on the local level
2. In many countries, national level REDD+ implementation & monitoring benefits from direct local community engagement
3. For local REDD+ monitoring, ignoring needs & opportunities from national level activities will likely result in insufficient and incompatible REDD+ results & benefits
4. Develop local >< national integration as win win situation

Overview

1. National level REDD+ MRV: background and needs
2. Local REDD+ monitoring: experiences and opportunities
3. Integrating local and national level monitoring
4. Concluding remarks

National level REDD+ MRV: background / needs

- Requirements for estimation and reporting: UNFCCC negotiations and the IPCC Good Practice Guidelines and Guidance for reporting to the international level
- Drivers and activities causing forest carbon change and the particulars of the REDD+ implementation strategy
- Assessment for MRV that should be based on an assessment of the gap between the existing national forest monitoring system and the requirements of a REDD+ MRV system

REDD+ at UNFCCC COP 16 (Cancun)


- *Requests* developing country Parties aiming to undertake activities ... to develop the following elements:
 - A national strategy or action plan;
 - A national forest reference (emission) level
 - A robust and transparent national forest monitoring system for the monitoring and reporting of REDD+
- New UNFCCC/SBSTA work program:
 - Identify land use, land use change and forestry activities in developing countries, in particular those that are linked to the drivers of deforestation and forest degradation

UNFCCC decisions on REDD+

- To establish ... robust and transparent national forest monitoring systems :
 - Use a combination of remote sensing and ground based forest carbon inventory approaches for estimating anthropogenic forest related GHG emissions and removals
 - Provide estimates that are transparent, consistent, accurate
 - Are transparent and their results are available and suitable for review
- Some suggestion to separate MRV (measuring, reporting and verification) of GHG emissions and removals, and tracking for the assessment of policies and measures (tracking activities)

IPCC Guidelines for National Greenhouse Gas Inventories

- Revised 1996 Guidelines, Land Use Change and Forestry (LUCF)
- 2000 Good Practice Guidance and Uncertainty Management (GPG2000)
- Good Practice Guidance for Land Use, Land Use Change and Forestry (GPG LULUCF)
- 2006 IPCC Guidelines for National Greenhouse Gas Inventories (AFOLU)



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Estimation gross carbon emissions

Gross carbon emissions Gross deforestation Gross degradation

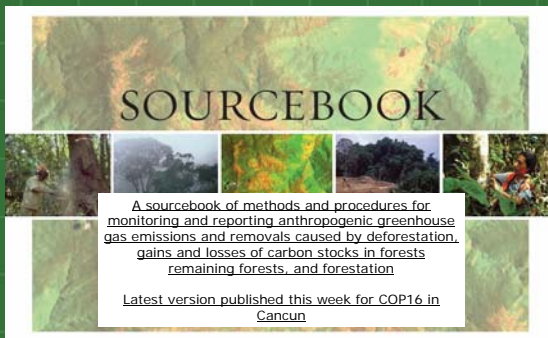
$$C_{gr_em} = \left(\sum_{i=1}^m A_{loss(i)} \cdot C_{loss(i)} \right) + \left(\sum_{i,j=1}^{n,m} A_{dgr(ij)} \cdot C_{dgr(ij)} \right)$$

A_{loss} = Area of deforestation (ha)
 C_{loss} = Carbon emission from deforestation (t/ha) for forest types $i \dots m$
 A_{dgr} = Area affected by degradation (ha) for degrad. types $j \dots n$
 C_{dgr} = Carbon emission from degradation (t/ha) for forest types $i \dots m$

Area change is most dynamic: commonly observed from satellite
Carbon stock change is considered in 5 carbon pools (biomass, dead, soil)

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GOFC-GOLD REDD+ Sourcebook



SOURCEBOOK

A sourcebook of methods and procedures for monitoring and reporting anthropogenic greenhouse gas emissions and removals caused by deforestation, gains and losses of carbon stocks in forests remaining forests, and forestation

Latest version published this week for COP16 in Cancun

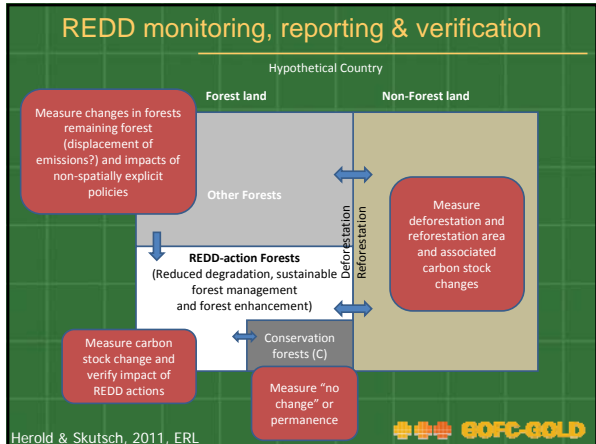
<http://www.gofc-gold.uni-jena.de/redd>

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Drivers and activities causing forest carbon change

- Type and importance of forest change activities within the country determine their importance in terms of the national REDD+ strategy and implementation
- different ways in which various activities affect the forest canopy and carbon have different implications regarding the appropriate ways of monitoring
- Forest area change: deforestation and reforestation
- Changes in forest remaining forests (degradation, rehabilitation, SFM)

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Remote Sensing and Science 2.0: deforestation case



Deforestation in the Brazilian Amazon, 1985-2010

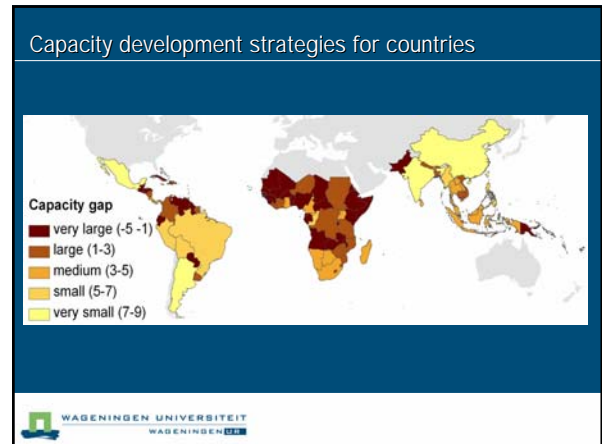
Brazil forms 'crisis cabinet' following unexpected deforestation surge

Source: Mongabay

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Options for monitoring historical forest degradation

Activity/driver of degradation	Activity data (on national level)	Emission factors (on national level)
Extraction of forest products for subsistence and local markets, such as fuelwood and charcoal	<ul style="list-style-type: none"> Limited historical data Information from local scale studies or national proxies Only long-term cumulative changes may be observed from historical satellite data 	<ul style="list-style-type: none"> Limited historical data Information from local scale studies, community-based monitoring Emission factors can be measured and consistently for historical periods
Industrial/commercial extraction of forest products such as selective logging	<ul style="list-style-type: none"> Historical satellite data (Landsat time series) analysed with concession areas Direct approach should be explored for recent years 	<ul style="list-style-type: none"> National forest inventories and harvest estimates from commercial forestry Emission factors can be measured and consistently for historical periods
Other disturbances such as (uncontrolled) wildfires	<ul style="list-style-type: none"> Historical satellite-based fire data records (since 2000) to be analysed with Landsat-type data 	<ul style="list-style-type: none"> Emission factors can be measured today and can be applied consistently for historical periods with suitable activity data



National level REDD+ MRV: background / needs

- Nh | #vrxhv#ir#qdwrcqdp UY=
 - International requirements (UNFCCC, IPCC GPG)
 - National characteristics (drivers and policy priorities)
 - Existing national capacities (roadmap to fill gaps)
- Z d | v#r#f#rp p xq#w#h#q#d#j#p hq#w#r#f#r#q#v#l#h#u#k#h#q#d#w#r#q#d#w#d#w#j | #l#g#p#s#p hq#w#r#q#s#u#r#u#w#h#v
- P d#q | #h#d#v#r#q#v#k | #f#r#p xq#w#h#v#k#r#x#g#h#h#l#y#r#y#g#q#p r#q#w#r#u#q#j#e#x#w#r#o#h#y#d#u#h#v

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Role of community monitoring in national REDD MRV

Forest Change Activity	Monitoring Options at National Level	Potential Contribution of Community Based Monitoring
Reforestation	<ul style="list-style-type: none"> Remote sensing, National forest inventory Monitoring through forestry companies 	<ul style="list-style-type: none"> Acquiring/signalling the location, time, area and type of change events (in near real time)
Deforestation	<ul style="list-style-type: none"> Remote sensing, National forest inventory 	<ul style="list-style-type: none"> Ground level measurements for local implementation (i.e. of reforestation plots) for national/other data sources
Forest degradation	Commercial activities, incl. selective logging	<ul style="list-style-type: none"> National forest inventory Commercial companies (i.e. harvest estimates) Remote sensing
	Wild fire	<ul style="list-style-type: none"> Remote sensing, National forest inventory
Forest enhancement	Subsistence forest use incl. fuel wood, charcoal, community forest management etc.	<ul style="list-style-type: none"> Limited historical data Possibly national forest inventory
	Increases in biomass due to REDD+ activities at project level	<ul style="list-style-type: none"> Regular ground level measurements and reporting of forests and carbon stocks Tracking growth/decrease of local activities (drivers)

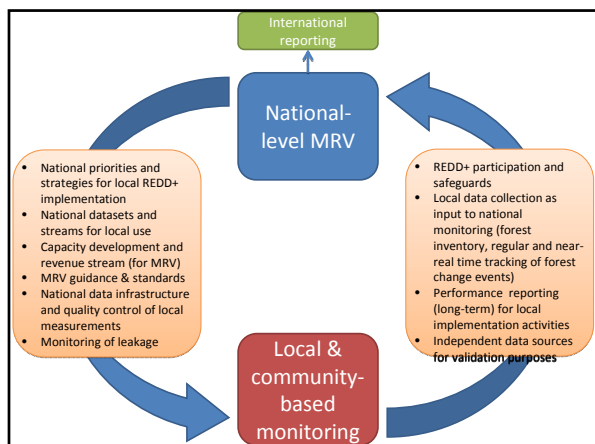
Quality for national monitoring from different sources

Acquisition type	Forest Inventory			Deforestation Area			Degradation Area				Cost per Area	
	DBH	Height	Tree species	Number of trees per plot	Commercial Clearing	Subsistence Agricult.	Infrastructure expans.	Selective logging	Fuel wood	Forest grazing		Wildfire
Coarse resolution RS	-	-	-	-	+	-	+	+	-	-	++	+
Medium resolution RS	-	-	-	-	+++	++	+++	+	-	-	++	+
Fine resolution RS	-	-	-	++	+++	+++	+++	++	+	++	++	++
Airborne LIDAR	-	+++	-	++	+++	+++	+++	++	++	++	++	++
Terrestrial LIDAR	+++	++	-	++	++	+	++	+	+	+	+	+++
RADAR RS (SAR)	-	+	-	-	+++	++	+++	+	-	-	++	++
Community monitoring	++	+	++	++	+	+	+	+	+++	++	++	+
Professional forest inventory	+++	+++	+++	+++	++	++	++	+++	++	+	+	++

Issues for community engagement

- Communities can provide important data streams:
 - Track changes and human activities
 - Forest inventory type measurements
 - Revisit time and long term monitoring
 - As independent data sources
- Some issues:
 - Importance varies depending on national priorities
 - Maybe spatially constraint (local!)
 - Requires validation and quality control
- Develop synergy among national and community based monitoring

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Issues for community engagement

- Technical issues to make local data useful on the national level:
 - *Guidance and standards* for data collection are essential
 - *Data collecting system*: open and efficient data exchange mechanisms
 - *Integrating local data into national databases* including quality control mechanism
 - *Information processing and analysis* for national level estimation and reporting

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Issues for community engagement

- Community engagement should not be limited to monitoring of forest carbon change
 - Active REDD+ implementation
 - Safeguards and co benefits
 - Engage in national REDD+ process
- Develop of reference emission levels (REL):
 - Different options to participate on national level discussions
 - Many locally driven forest change processes can not be monitored historically due to the lack of data
 - Develop of REL problematic – assume net zero reference and only measure positive carbon impact?

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Web resources

- **GOFC-GOLD:**
 - <http://www.fao.org/gtos/gofc-gold/>
- **GOFC-GOLD land cover project office:**
 - <http://www.gofc-gold.uni-jena.de/>
- **GOFC-GOLD REDD sourcebook:**
 - <http://www.gofc-gold.uni-jena.de/redd>
- **IPCC background paper on use of remote sensing in LULUCF sector (GOFC-GOLD 33):**
 - <http://www.fao.org/gtos/gofc-gold/series.html>
- **UNFCCC/SBSTA technical paper on costs of monitoring for REDD**

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