# Methodological Aspect to Define Emission Reference

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Botani Square, 15 Oct 2009
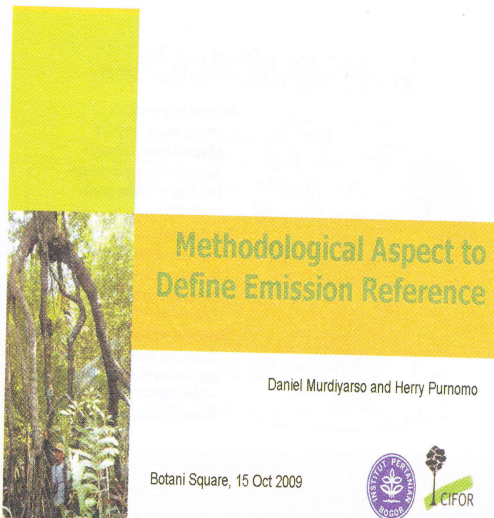
## Outline

- Background
  - REDD and REDD-plus
  - Definitions
- Implications for REL/RL settings
- Options for effective REDD
- (Cost)-efficient RL and MRV
- Addressing equity and national circumstances
- A quota system?
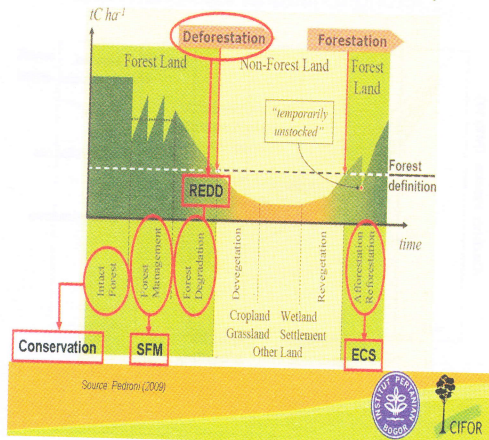- Concluding remarks

## REDD-plus
### As of 18 March 2009

- There was a general consensus that REDD activities are to be broadened
- A new term: REDD-plus was launched/agreed
- REDD-plus relates to:
  - Reducing emissions from deforestation and forest degradation in developing countries
  - The role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries

http://unfccc.int/documentation/documents/items/3595.php#beg

FCCC/SBSTA/2009/L.9
(Draft Decision -/CP.15)

## IPCC definitions, REDD, and REDD-plus



Source: Pedroni (2009)

## Definitions

- **Baseline** is the sum of *carbon stock* changes that would occur within the boundary of the project area in the absence of the proposed REDD/CDM project activity
- **Reference emissions level** (REL) is the amount of gross *emissions* from a geographical area estimated within a reference time period (REDD)
- **Reference level** (RL) is the amount of net/gross *emissions and removals* from a geographical area estimated within a reference time period (REDD-plus)

## Implications for REL/RL settings

- Base period – decisions have to be made:
  - How long?
  - When does it start?
  - How long is it projected forward?
  - When does it need to be reviewed?
- C-stock change (emissions) rather than area change
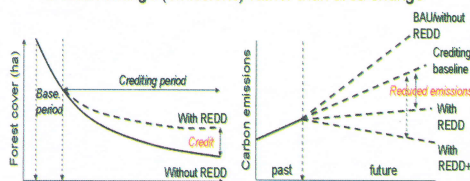


## Drivers in Indonesia

- Direct drivers
  - natural causes (e.g. El Nino. natural fires and high rainfall)
  - human activities (e.g. logging. illegal logging. plantation development)
- Underlying causes
  - Market failures (e.g. underpricing of stumpage value)
  - Policy failures (e.g. premature implementation of regional autonomy)
  - governance weakness (e.g. weak law enforcement and land tenure)
  - broader socio-economic and political issues (e.g. economic crisis. reform era and high population growth)

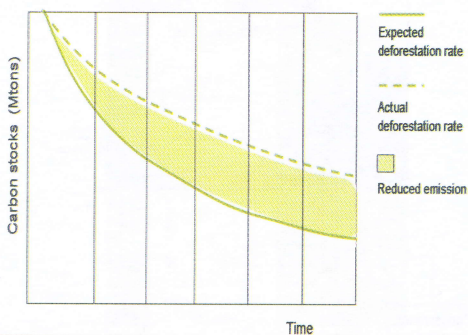( Contreras-Hermosilla, 2000)

## Options for effective REDD
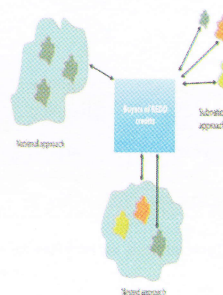
**National approach**
- Creates country ownership
- Addresses domestic leakage
- Sensitive to governance failures
- Less likely to mobilize private investment

**Sub-national**
- Allow early action and wide participation
- Sensitive to domestic leakage
- Cannot address wider driving forces of deforestation and forest degradation

**Nested approach**
- Allows early start with sub-national activities and gradually move to a national approach
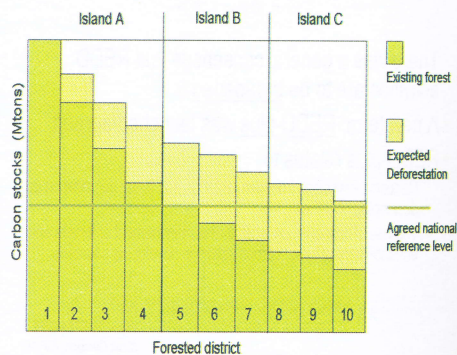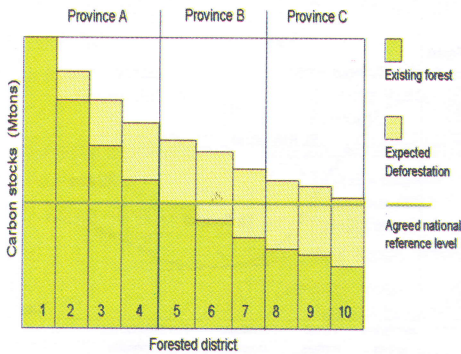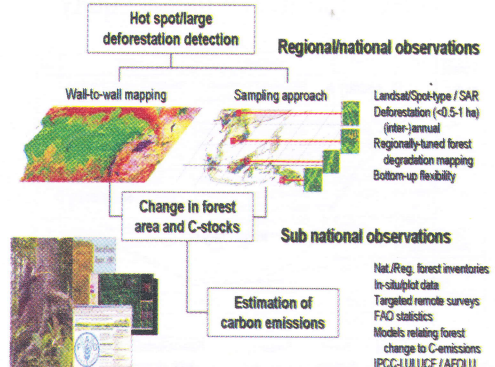- Challenges to harmonize two levels



## Setting a national reference level



## Calculating sub-national credits/debits

## Calculating sub-national credits/debits



Province A | Province B | Province C

Carbon stocks (Mtons)

Forested district: 1 2 3 4 5 6 7 8 9 10

Existing forest

Expected Deforestation

Agreed national reference level

## Cost-efficient RL and MRV



Hot spot/large deforestation detection

Regional/national observations

Wall-to-wall mapping — Sampling approach

Landsat/Spot-type / SAR Deforestation (<0.5-1 ha) (inter-)annual
Regionally-tuned forest degradation mapping
Bottom-up flexibility

Change in forest area and C-stocks

Sub national observations

Nat./Reg. forest inventories
In-situ/plot data
Targeted remote surveys
FAO statistics
Models relating forest change to C-emissions
IPCC-LULUCF / AFOLU

Estimation of carbon emissions

Source: GOFC-GOLD (2008)

## Land Cover Change Matrix

| | | Land cover 2006 (m ha) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | FL | CL | GL | WL | SL | OL | ND | Total |
| Land cover 2003 | FL | 89.11 | 1.22 | 1.64 | 0.47 | 0.02 | 0.45 | 0.69 | 93.60 |
| | CL | 0.87 | 45.28 | 1.09 | 0.30 | 0.35 | 0.39 | 0.18 | 48.45 |
| | GL | 1.79 | 1.27 | 14.73 | 0.49 | 0.03 | 0.21 | 0.15 | 18.66 |
| | WL | 1.22 | 0.65 | 0.58 | 7.78 | 0.03 | 0.30 | 0.01 | 10.57 |
| | SL | 0.03 | 0.17 | 0.04 | 0.01 | 2.61 | 0.02 | 0.01 | 2.91 |
| | OL | 0.20 | 0.28 | 0.32 | 0.11 | 0.02 | 2.09 | 0.01 | 3.02 |
| | ND | 5.25 | 1.50 | 1.03 | 0.20 | 0.04 | 0.17 | 2.51 | 10.70 |
| Total | | 98.46 | 50.37 | 19.42 | 9.36 | 3.09 | 3.63 | 3.57 | 187.91 |

FL = Forest Land. CL = Cropland. GL=Grassland.
WL=Wetland. SL=Settlement. OL= Other Land. ND= No data
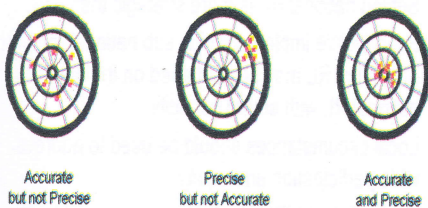
Budiharto, 2008

## Required capacities

- Data and knowledge of processes relating to REDD, GHG emissions, drivers and expected future developments – to develop historical RL
- Expertise in spatial and temporal analysis and modeling tools – to address domestic leakage
- Specifications for a national implementation framework for REDD – re accuracy and precision in the reporting
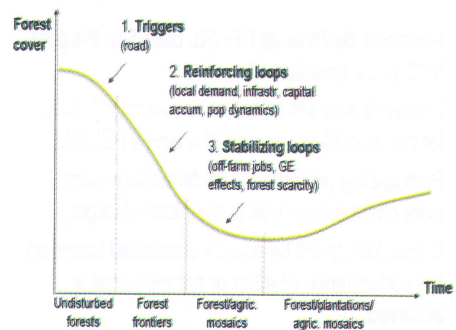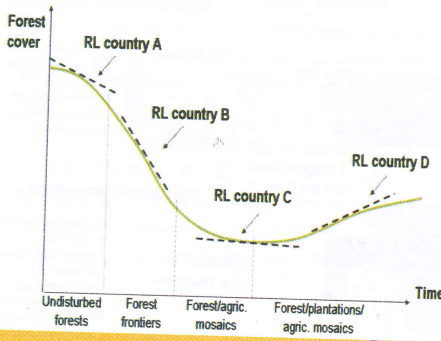
## Cost-associated accuracy and precision



Accurate but not Precise

Precise but not Accurate

Accurate and Precise

Source: FCCC/TP/2009/1

## von Thünen curve to address equity



Forest cover

1. Triggers (road)

2. Reinforcing loops (local demand, infrastr, capital accum, pop dynamics)

3. Stabilizing loops (off-farm jobs, GE effects, forest scarcity)

Time

Undisturbed forests | Forest frontiers | Forest/agric. mosaics | Forest/plantations/ agric. mosaics

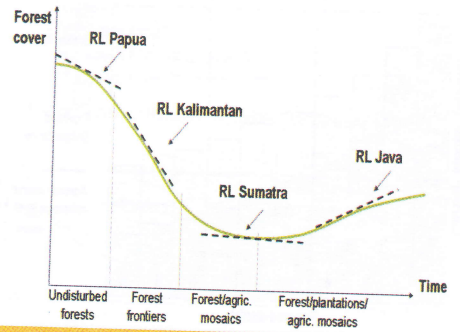Source: Kaimowitz and Angelsen (1998)

## Forest transition – global equity



## Forest transition – national equity



## Clustering by district

| | | Deforestation rate | |
|---|---|---|---|
| | | Low | High |
| Forest cover | Rich | Districts A, C | Districts B, J |
| | Poor | Districts D, F, H, I | Districts E, G |

## Cluster of forest cover and deforestation rate



## A quota system?

- Indonesia declares its REL/RL based on the past 5-10 years emission rates
- Indonesia is to set an emission reduction target for the next 10 years, say 20% below REL/RL
- Participating provinces/districts/management units orient themselves to the national target
- Credits/debits will be equally distributed based on the performance whether or not the target is achieved

## Concluding remarks

- REDD-plus would provide more opportunities to develop different types of REDD projects
- Setting national RL is more strategic than REL
- For effective implementation sub national (provincial or district) RL may be set based on the quota from national RL with sound capacity
- Local circumstances should be used to address wide participation and equity
- Cost-efficient MRV should be encouraged to enhance the benefits

| Forest rich, low deforestation (%) | Forest rich, high deforestation (%) |
|---|---|
| Africa: Gabon, DR-Congo, Rep. of Congo | Africa: Ghana, Liberia, Equatorial Guinea, Cameroon, CAR |
| Asia-P: PNG | Asia-P: Cambodia, Lao, Indonesia |
| L. America: Colombia, Guyana, Suriname  **7** | L. America: Bolivia, Honduras, Guatemala, Mexico, Panama, Peru  **13** |

| Forest poor, low deforestation (%) | Forest poor, high deforestation (%) |
|---|---|
| Asia-P: Vanuatu | Africa: Ethiopia, Madagascar, Mozambique, Kenya, Uganda, Tanzania |
| L. America: Argentina, Chile, Costa Rica, | Asia-P: Nepal, Thailand, Vietnam |
|  **4** | L. America: El Salvador, Nicaragua, Paraguay  **13** |

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## CIFOR's Research on REDD

| No | Title | Partners | Donor | Beneficiaries |
|---|---|---|---|---|
| 1 | Research to Support Design and Implementation for REDD Effectiveness | Government of Indonesia and Australia, CSIRO, ANU | AusAID | Local and national govt for improved forest governance |
| 2 | Strengthening REDD Implementation in Indonesia | National organizations, CSOs, journalists universities and local and national government | Packard Foundation | Local people and forest dwellers from equitable and sustainable forest management |
| 3 | Analyzing future options for forests in the post 2012 climate regime | Research organizations and Univ. in the participating countries Policy and practitioner partners from government agencies, CSOs, Communication intermediaries and news media | Packard Foundation | Practitioners/REDD developers |
| 4 | Learning from REDD: A Global Comparative Analysis | | NORAD | The global community from stabilized climate |
| 5 | REDD-ALERT | Research agencies and Universities in Europe, LA, Asia and Africa | EU-FP7 | USAID missions Civil societies Scientific community |
| 6 | Forest and climate change | ICRAF, CSOs | USAID | |
| 7 | The Indo-Pacific forest carbon study on tropical carbon-rich pools | IPIF-Hawaii, Universities, CSOs | US FS | |

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