Reference Scenarios

Global Dialogue on Developing a Readiness Preparation Proposal
August 13-14, 2009

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- What is a reference scenario?
  - **Basis to compare the actual reality under a REDD policy, with a scenario of business-as-usual if no REDD policy occurred**
  - **Objective is to have a basis for estimating emissions reductions and REDD payments : Difference between reference scenario and measured performance**

- General Policy and Planning Issues:
  1. Scope: Deforestation? Degradation? REDD+?
  2. Terminology: UNFCCC negotiations uses “reference levels” and “reference emission levels”. FCPF is a pilot program and uses “reference scenario”, to avoid any implication for UNFCCC process
  3. Scale: national only, or scenarios for sub-national regions?
  4. Methods: UNFCCC methods not clear yet.

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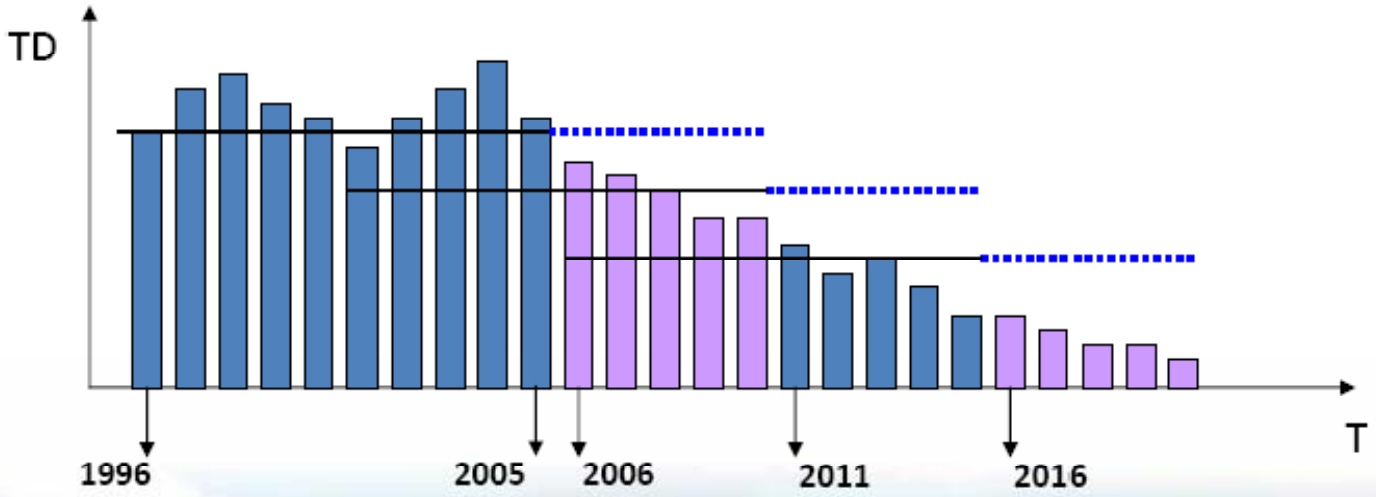
Brazil: Amazon Fund: Example of One Approach for a Historic Reference Scenario

AVERAGE DEFORESTATION RATE

- Using 10 years average
- ADR revised every 5 years



Year of Reference	Period for ADF calculation	ADF
2006 to 2010	1996 to 2005	1,95 million ha

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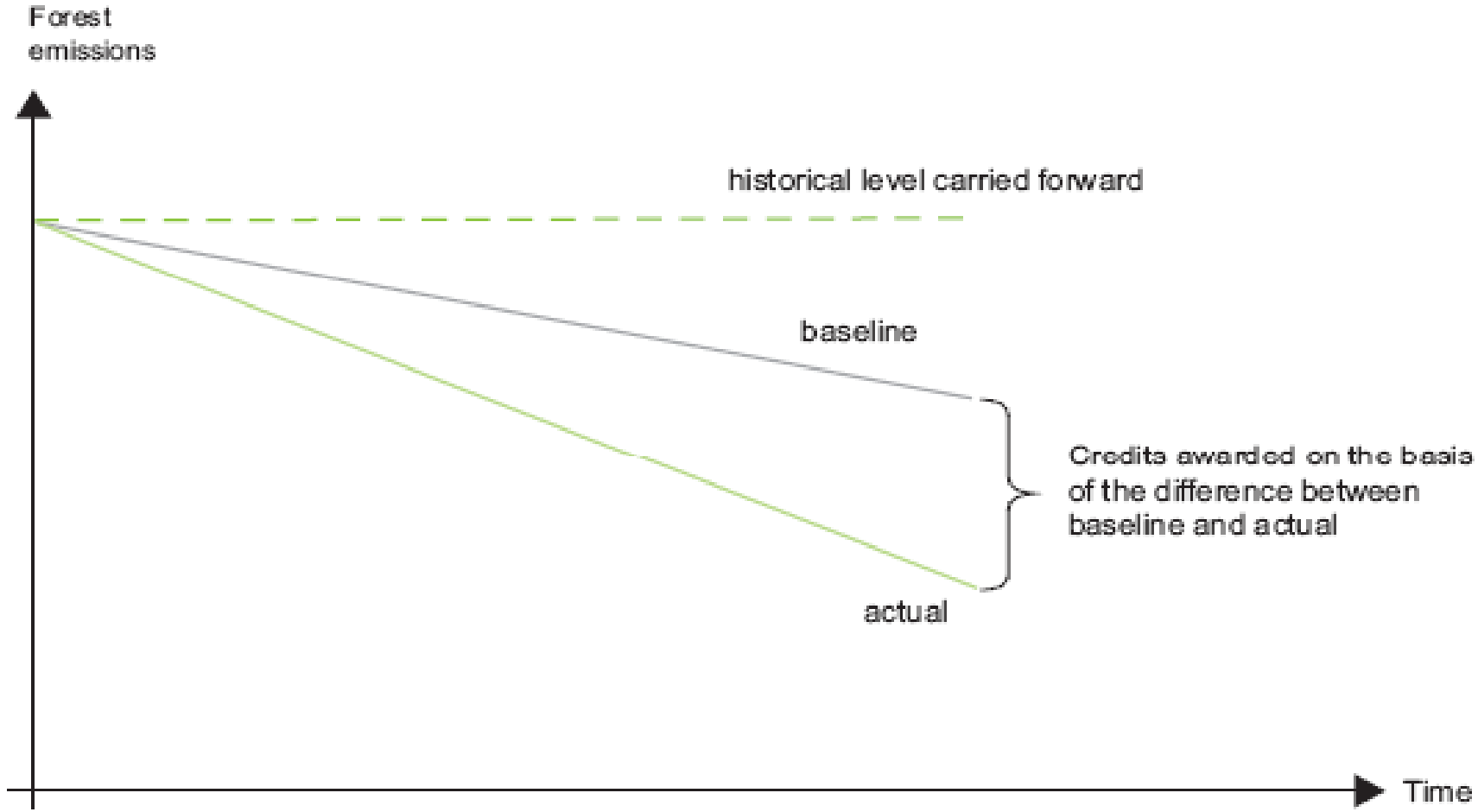
We usually think of a historic approach …but Reference Scenarios might look different

Figure 9.1: Illustration of a baseline-credit system



Source: Eliasch Report

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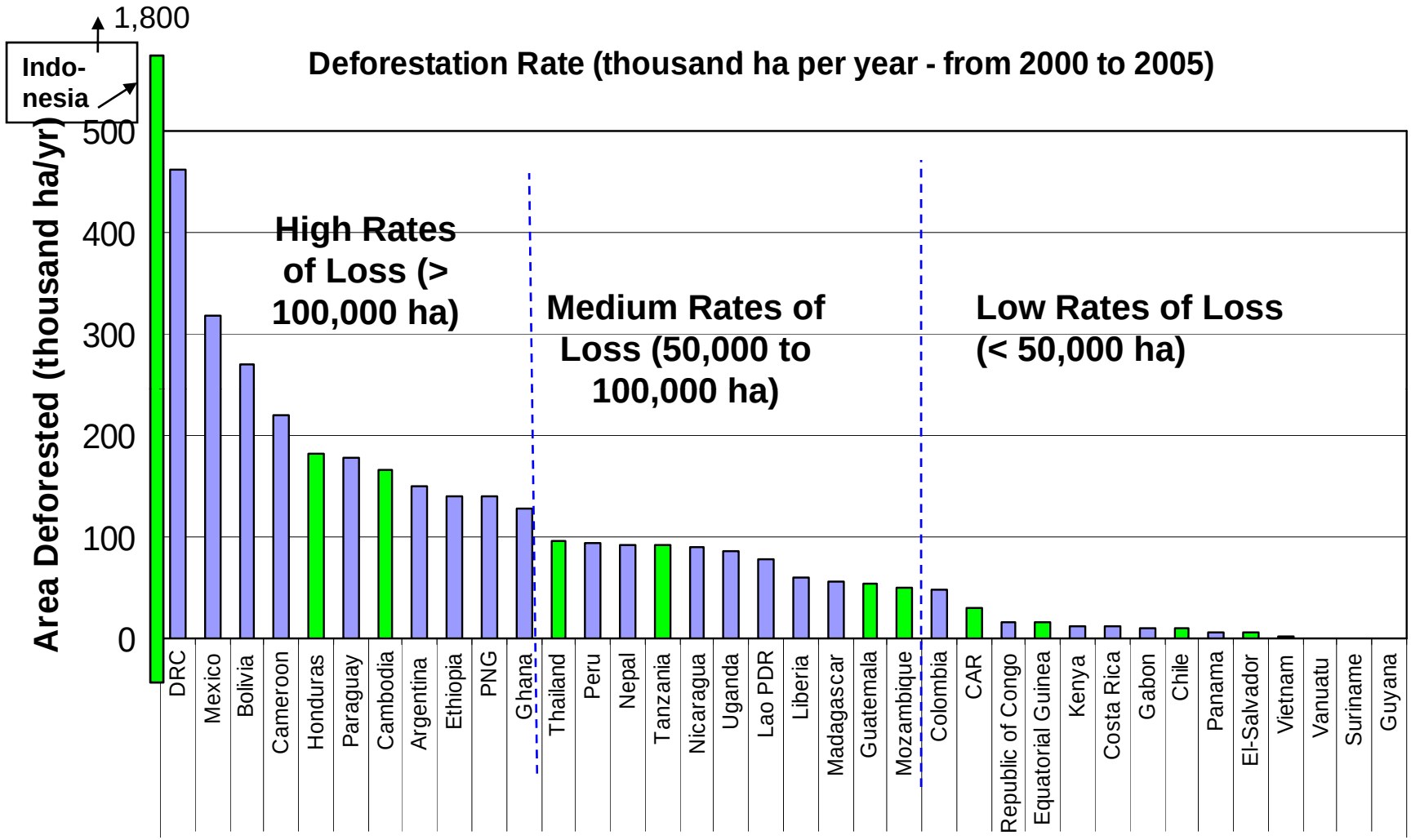
FCPF Countries in REDD: Different scales of deforestation



Countries selected in March 2008

Countries selected in March 2009 PC meeting

Source: FAO FRA 2005

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First steps

- **Why define a Reference scenario now, as there is not sufficient guidance available? What can be done before UNFCCC provides guidance/methods:**
  - **Advance analytical work:**
    - gather relevant historic information
    - Analyze historic trends of land cover change
    - Understand deforestation causes and drivers and relevance for the future, to make projections
  - **Country can compare methods and results of preliminary reference scenarios, for use in demonstration projects (eg. Brazil) and for informing the eventual decision on a national reference scenario**
- **Important:**
  - **Reference scenarios might need revision when UNFCCC guidance is available: which might be several years**
  - **For the purpose of credibility, consider conservative approaches**

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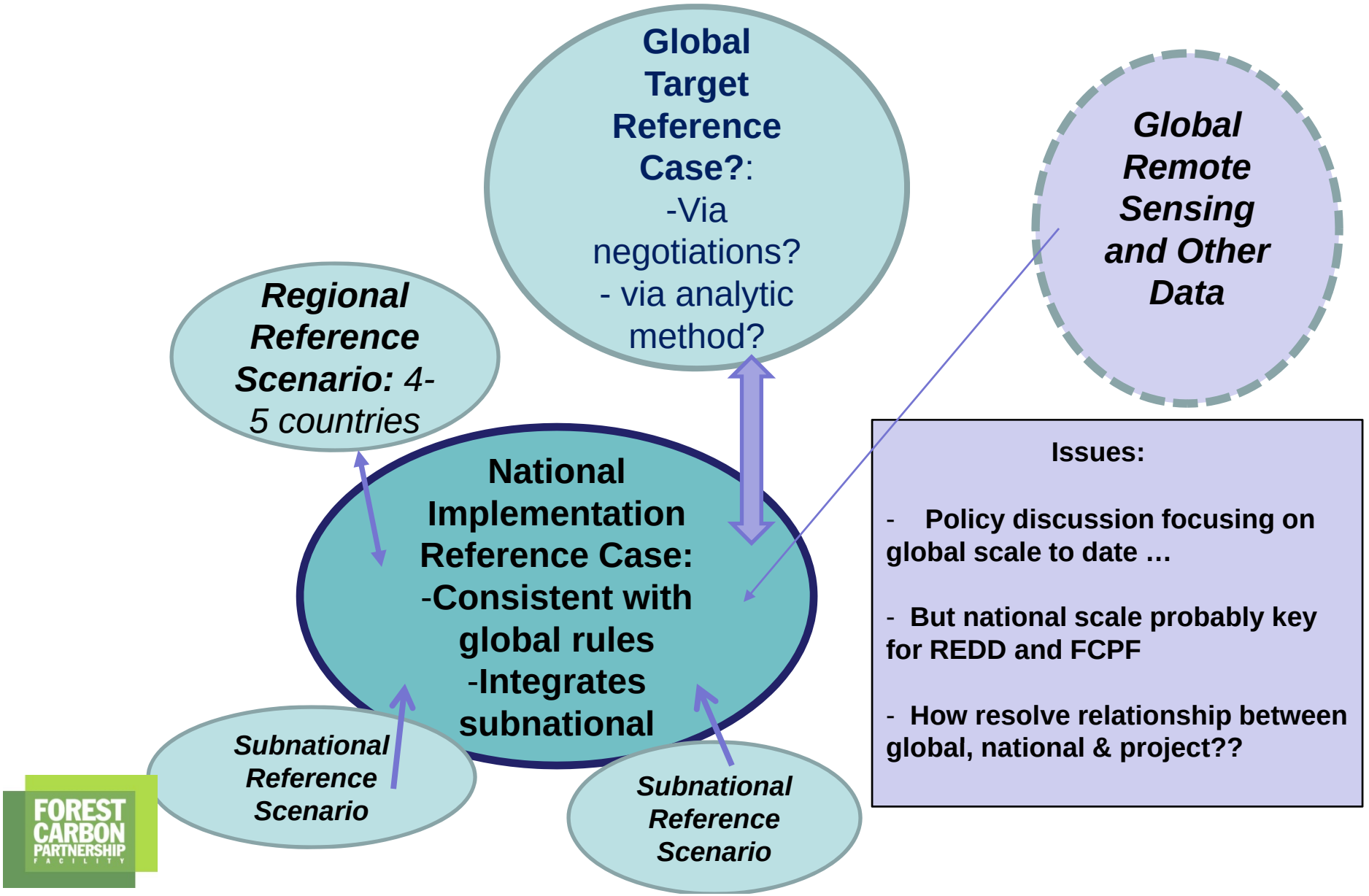
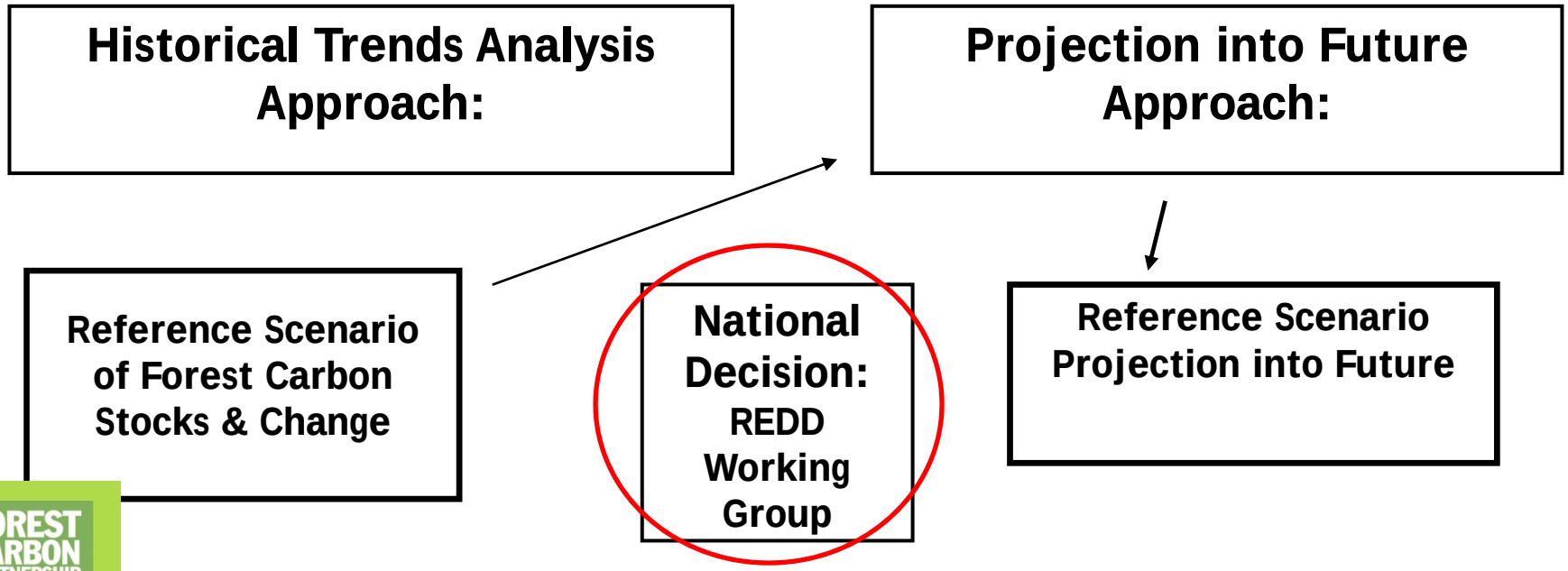
Reference Scenarios in the international debate and context



R-PP – Develop a Reference Scenario

- Assess Data available: Forest Area, land cover changes, carbon density maps, inventories,
- Identify gaps in data
- Analyze historic trends in land cover change & forest carbon
- Develop historic trends, and/or projection forward in time



Two Major approaches:
Historic Trends of past deforestation
Projections into the Future

Historical Trends Analysis Approach:

Projection into Future Approach:

Deforestation & Degradation Data:
- Analyze data on historic land cover trends
- Develop baseline forest cover map
- Assemble forest inventory data (area change, biomass density)

Projection Data & Methods;
- National development plans
- Economic trend analysis & forecast
- Macroeconomic trends (global ag commodity, wood demand, biofuel projections)
- Develop historical trends extrapolation methods
- Adapt modeling tools for REDD

Reference Scenario of Forest Cover Change:
- Defined by data availability (e.g., previous 15 years, 3 data points?)

Reference Scenario of Forest Carbon Stocks & Change:
- Historical trends
- Use carbon stock data
- Carbon models

Reference Scenario of Forest Carbon Degradation (Change in C Stocks) & Change

National REDD Working Group Process:
- Review and acceptance of scenario
- Stakeholder consultations
- Expert review of scenario

Reference Scenario Projection into Future:
- **Deforestation: forest area change**
- **Degradation: biomass and carbon density change**

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Simplified steps to analyze historic trends

1) Gather Deforestation & Degradation data in the past:

- Analyze data on historic land cover (e.g., forest) trends, from forest inventory and remote sensing data
- 10 to 15 years back usually adequate (<u>when</u>)
- Develop baseline forest cover map for a date (year): to provide geospatial resolution (i.e., <u>where</u> deforestation occurs)
- Assemble forest inventory or literature data on biomass density of forests, to estimate carbon stocking per hectare.

2) Identify "driver" data layers (e.g., roads, sawmills, elevations, proximity to rivers), & which best explain deforestation (to locate deforestation and allow eventual projections into future).

3) Convert area deforested into CO_2 emissions and locations using carbon density data ⇨ Reference Scenario of Change in Forest Carbon Stocks over time.

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Simplified steps to analyze future trends

1) Start with historic trends reference scenario

2) Develop historical trends extrapolation methods:

Review "driver" data layers (e.g., roads, sawmills, proximity to rivers) and determine which have the most potential to predict location of future deforestation.

3) Assess: - National development plans

- Economic and population trend analysis & forecast

- Macroeconomic trends (global agriculture commodity, wood ,and biofuel demand & supply projections)

4) Simulate deforestation from historic scenario to future dates using various "driver" variables & maps

5) Convert area deforested into CO_2 emissions using carbon density data and estimates of future density.

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Analytic considerations:

- Which approach to use depends on country land use and policy situation to be reflected:
  - e.g., expected changes in drivers of deforestation, major new infra-structure projects, commodity crop expansion, demographic patterns, etc.
- What assumptions should be made about incorporating national development plans and programs in the reference case?
- How should managed/unmanaged forests, planned and unplanned deforestation be handled?
- How to align methods and estimation results for REDD or other projects or sub-national activities? How can national & project reference cases be consistent, or comparable?
  - IPCC does not address sub-national reference scenarios
  - VCS does not address national reference scenarios…

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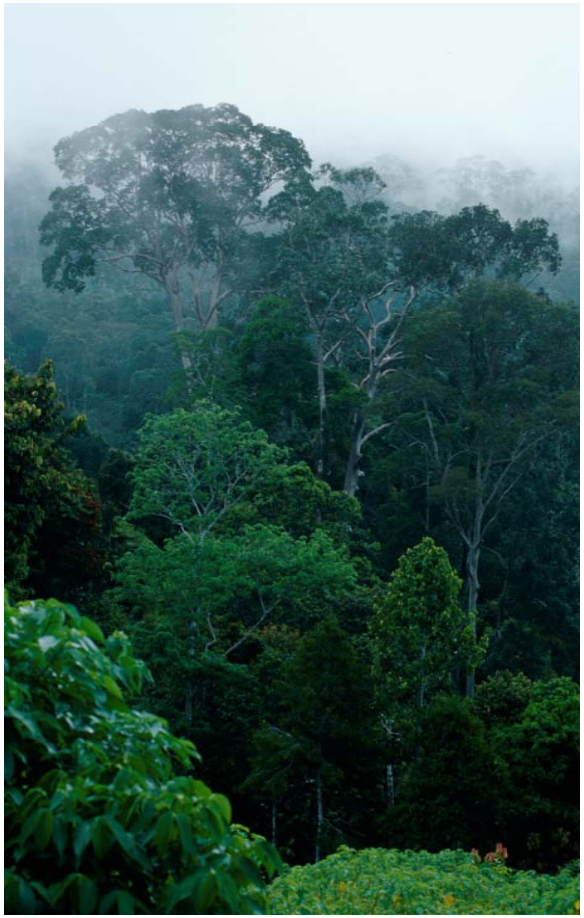
Links between National and Sub national level

Issue: How to resolve use of different methods, at different scales?

e.g., subnational projects or regions might use higher-resolution forest data and different methods, compared to the national approach for the entire country.

- Matching of multiple scale reference cases, and Allocation of National Reference Emissions to Sub-National Level ,are likely to be Complex .



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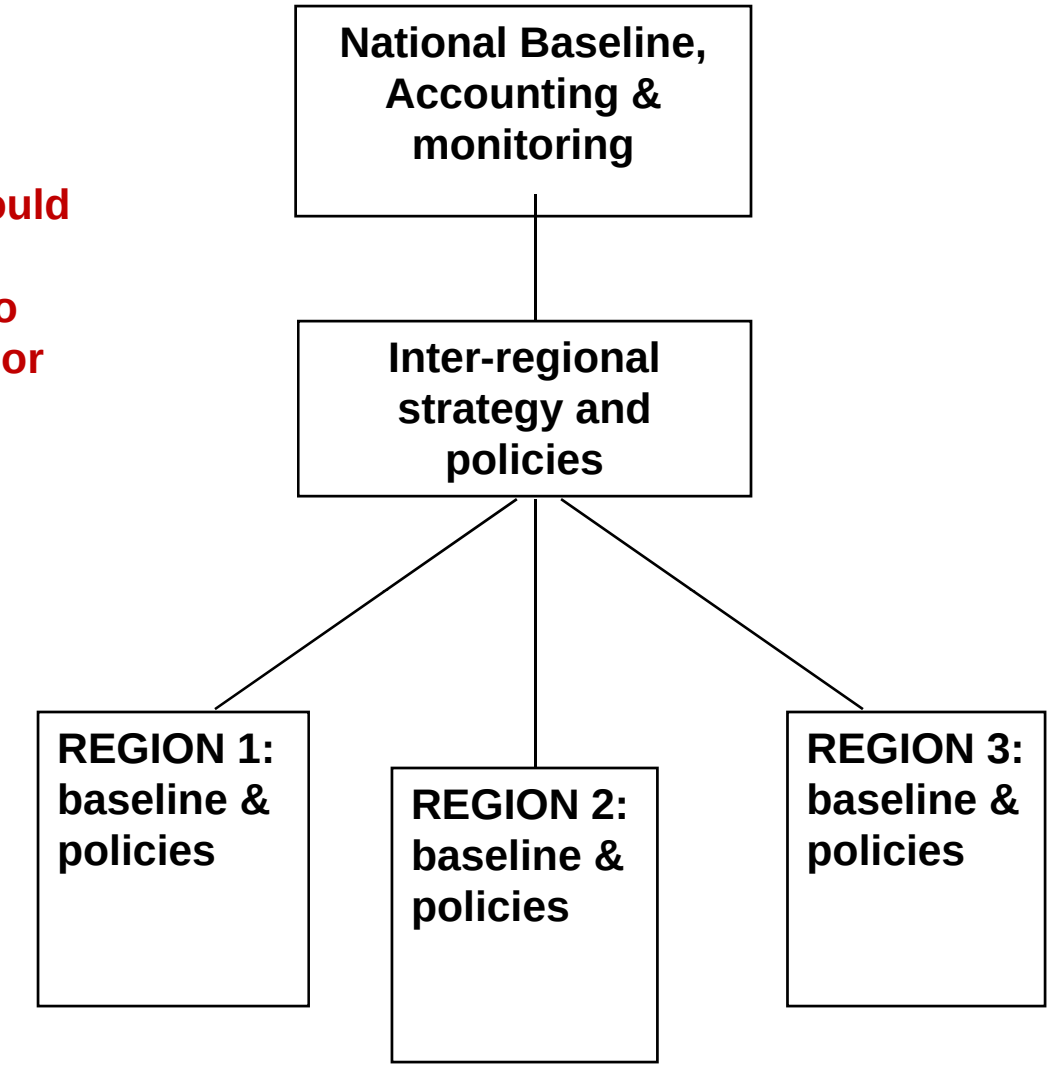
Reference scenarios could be set at:

- **National scale, or also**
- **Subnational regions, or RED projects.**
- **But, need to be harmonized.**



Adapted from: Andrea Cattaneo, Woods Hole Research Center

Early Ideas on Regional Approach: Congo Basin)

TRACK 1:
Regional "Rapid REDD Assessment"

(quicker, but less precise)

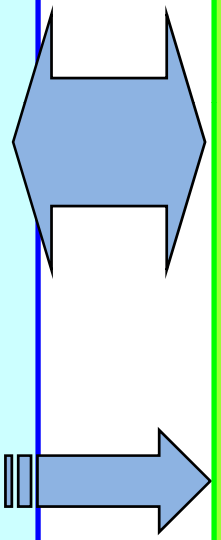
Develop Decision Support tools to meet policy needs:

- **Potential future land use assessment (e.g, commodity crops land suitability).**
- **Early policy scenarios.**

Regional workshop

- **Inform longer-term modeling decisions.**

Start with existing <u>regional</u> model(s) to perform quick analysis.



TRACK 2:
Capacity Building:
All Countries

(longer term, but detailed country results)

- **Cooperate with many institutions for data, remote sensing, policy scenarios to model, etc.**

- **Assemble In-Country Modeling Team:**
  - **-Data**
  - **-Reference Scenario**
  - **-Policy Scenarios**

- **Produce <u>national</u> model for REDD**

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Regional regional reference case for the Congo Basin

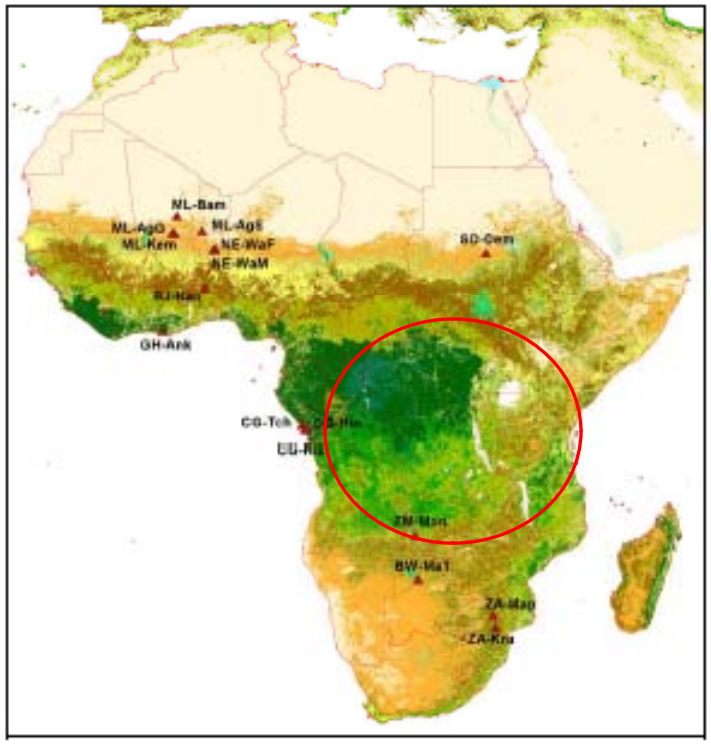

Figure 1. GlobalCover continental map of Africa Land Cover (from ESA - European Space Agency, http://ionia1.esrin.esa.int/index.asp) showing the location of the sixteen eddy covariance sites that are run by or contribute data to the CarboAfrica project. The GlobCover dataset is derived from December 2004 - June 2006 observations at 300m MERIS sensor on board the ENVISAT satellite mission.

Questions to Explore:

- **What do the 6 countries need, and can support, by when?**
- **How to set a reference case for a region?**
- **How deal with individual countries within it?**
- **What kind of approach/tool best for this region, which is relatively data-poor and capacity-limited??**
- **Can we start with something simple in approach to get countries involved and trained, then move to more sophisticated tool later??**
- **Or develop more sophisticated tool now, like a simple partial equilibrium model for the Basin??**

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