The Role of Measurement in the Economics of REDD+

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Introduction

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REDD is recognized as having great potential to be a cost-effective component in the portfolio of climate change policies

Uncertainty affects the cost-effectiveness and the political feasibility of REDD

- **Uncertainty can deter participation both on the demand-side and supply-side of REDD "credits"**

$$AER_{i,t} = PAE_{i} \cdot (HE_{i,t} - E_{i,t})$$

Program Design

Metrics and Policies

- **What is measured affects how policies are designed**
- **A metric with limited information content can distort incentives relative to policy objective**
  - Example – Using a proxy for an environmental variable
  - Measure the effluent of an industry instead of actual pollutant reaching a river

$$AER_{i,t} = PAE_{i} \cdot (HE_{i,t} - E_{i,t})$$

Program Design

Implications for measurement

- REDD Proposals may rely on measuring
  - (i) Forest carbon stocks
  - (ii) Changes in carbon stocks

- But could also be based more simply on forest hectares of reduced deforestation
  - Example – Amazon Fund in Brazil

Depends on the perception of what is available and at what cost

Challenges

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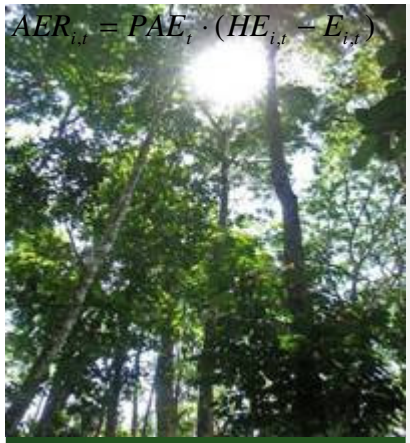
REDD will have to be a multi-level incentive system – where does uncertainty occur?

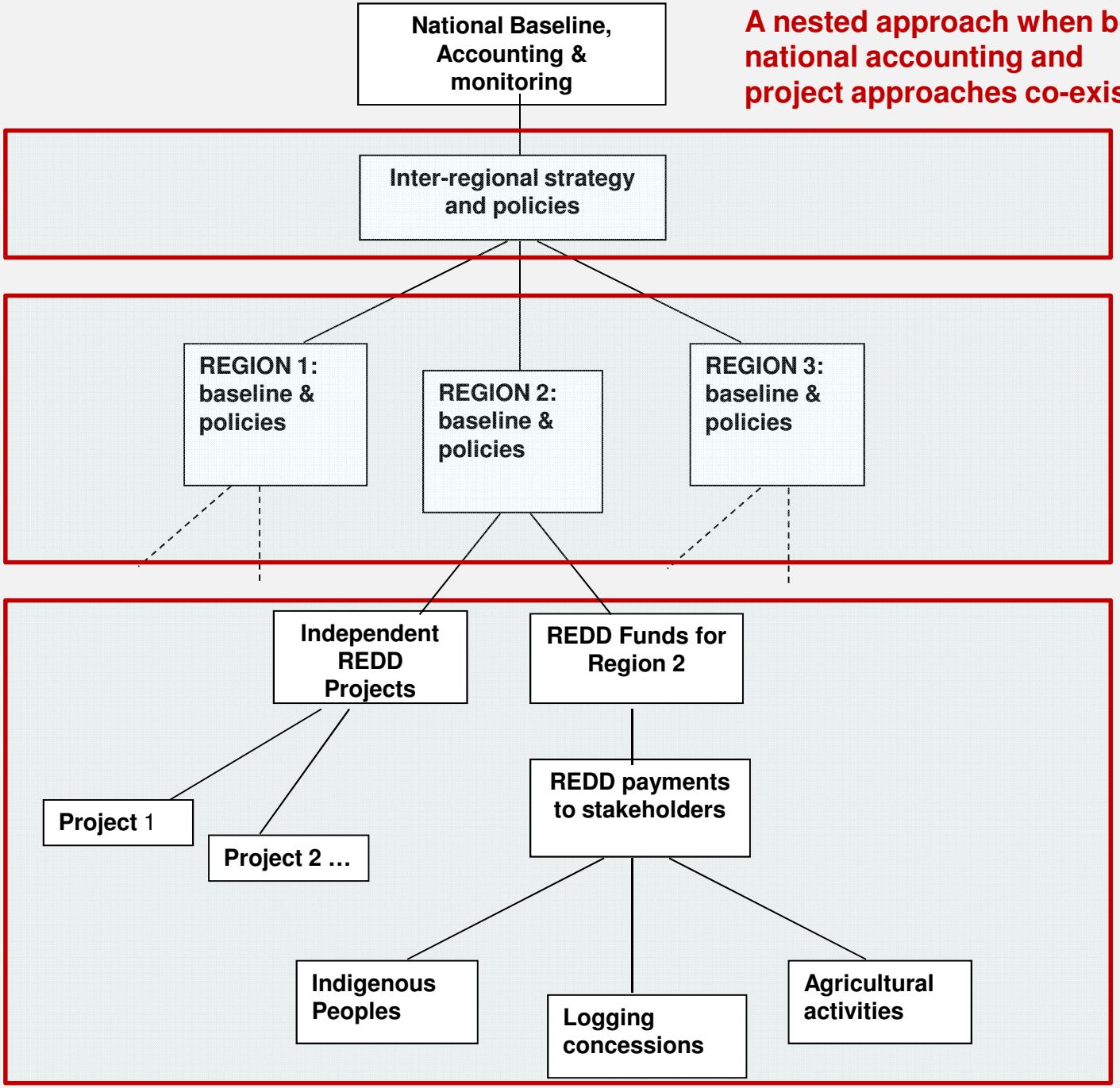
- Uncertainty on carbon stocks and flows (MRV)
- This uncertainty depends on measurement techniques and scale of interest
- Other sources of uncertainty: Imperfect knowledge of drivers, impact of REDD actions

$$AER_{i,t} = PAE_t \cdot (HE_{i,t} - E_{i,t})$$



Multi-scale aspects of REDD

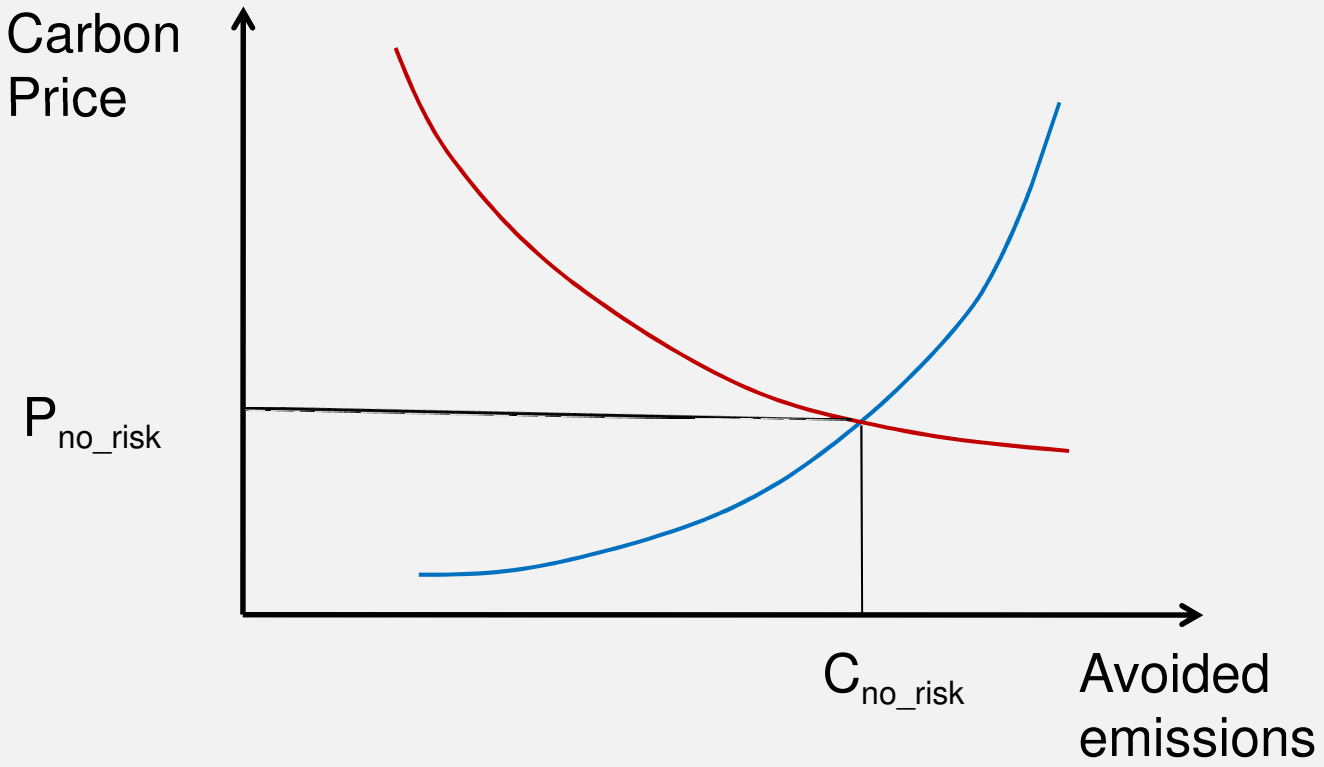
A nested approach when both national accounting and project approaches co-exist



Uncertainty on carbon

Representing the impact of risk on supply and demand of REDD

Supply and demand without any risk



Uncertainty on carbon

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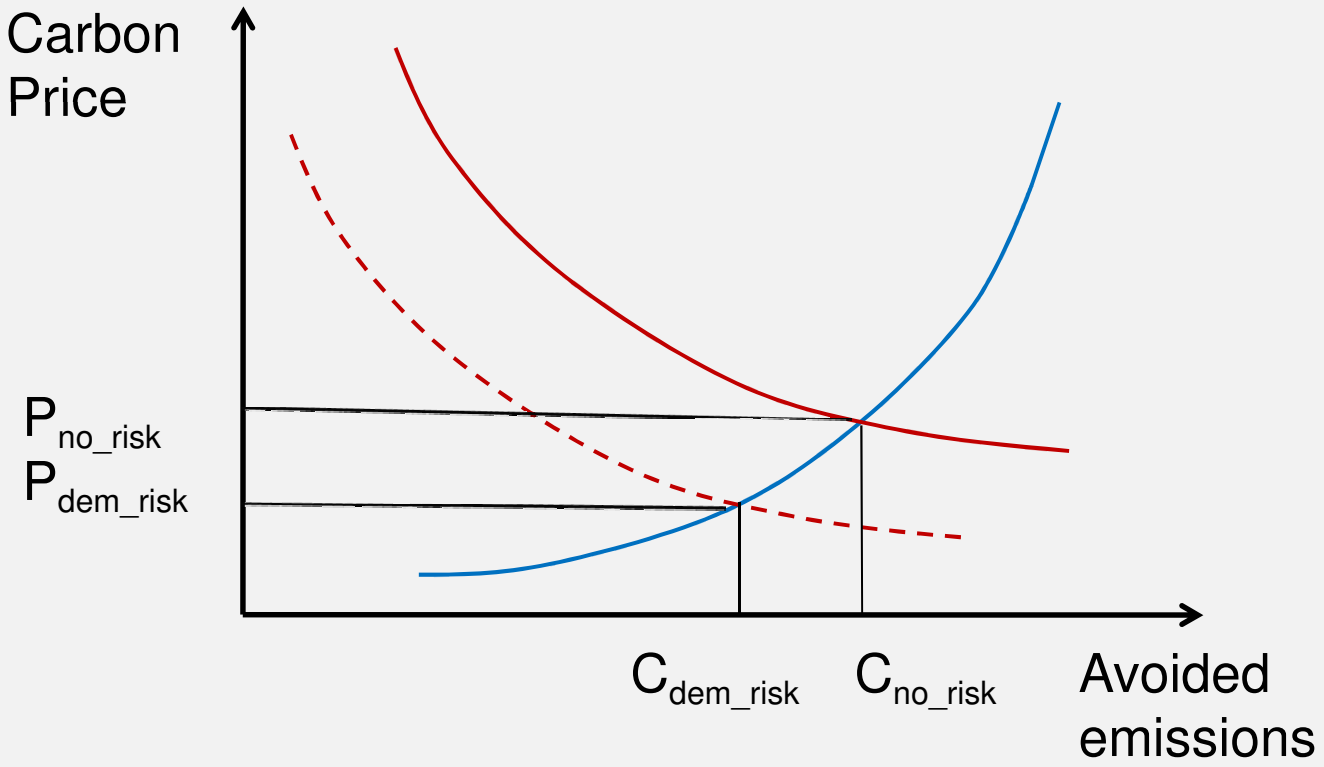
Representing the impact of risk on supply and demand of REDD

— Introduce risk from buyer's perspective: "quantifying carbon","delivery risk", "counterparty"



Uncertainty on carbon

Uncertainty under different monitoring methods for carbon stock density

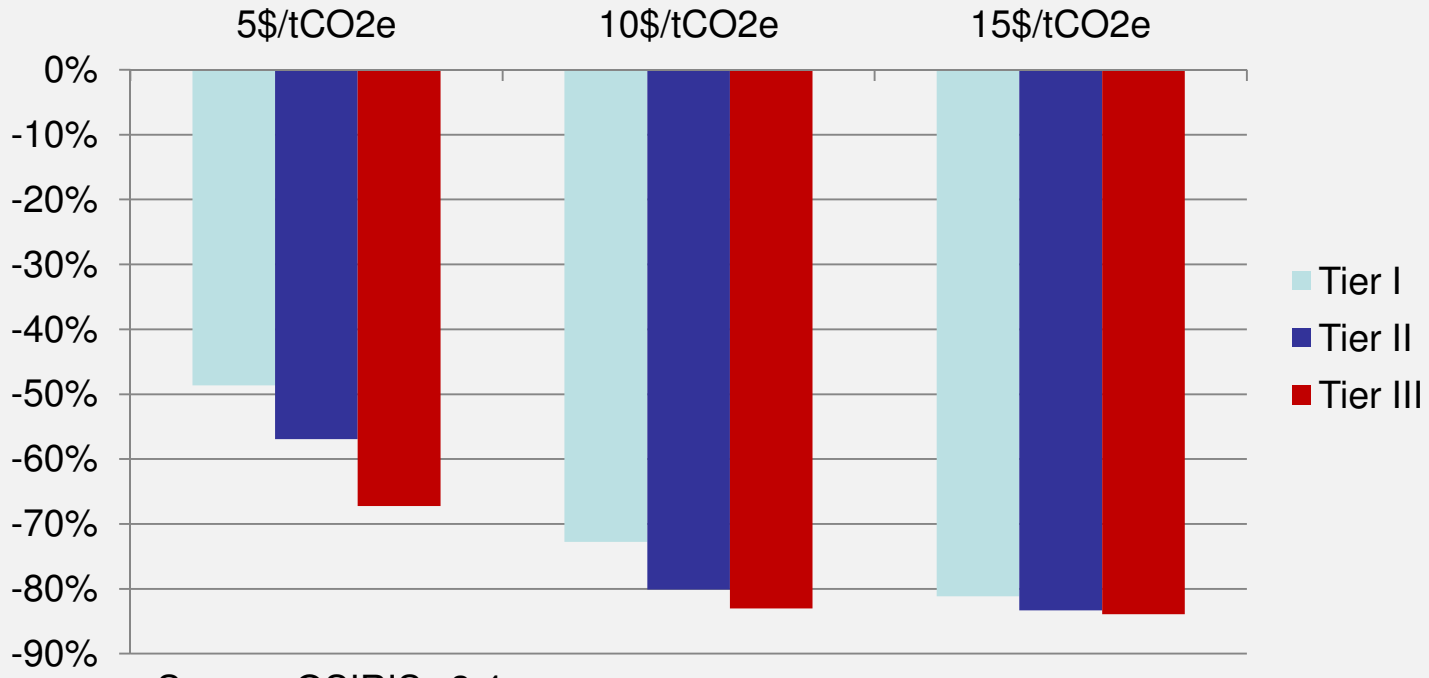
- IPCC has different Tier levels
- From the lowest where the 95% confidence interval is ±50% of an estimate
- To the highest where the confidence interval depends on a combination of advanced data collection techniques [95% CI is ± 12-16%]

Present results of an economic model highlighting the impact of these different confidence intervals

- Includes 84 potential REDD countries
- Assumes the “Conservativeness Principle” is applied
- A credit must have 95% confidence of being “real”
- Higher uncertainty means higher discounting of credits

Uncertainty on carbon

Global Change in deforestation emissions (%) by REDD payment level and MRV Tiers



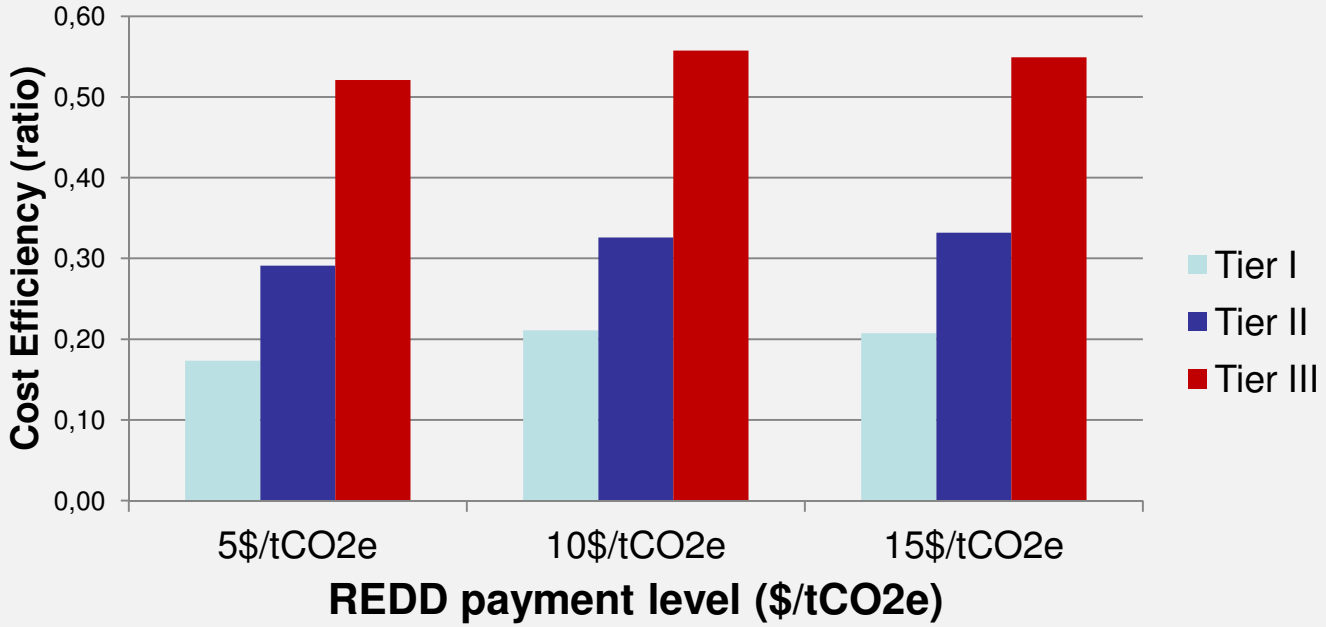
Source: OSIRIS v3.4

At lower payment levels the uncertainty in MRV has a considerable impact on REDD success

- The discount applied to credits discourages participation in REDD at lower payment levels

Uncertainty on carbon

Cost Efficiency (creditable CO2e reductions/unit payment)



Source: OSIRIS v3.4

Discrepancy between tiers remains also at higher payment levels

- Result driven by discounting

The remaining inefficiency is tied to uncertainty in counterfactuals and to program design

Summing up

- There is risk both on the demand side and the supply side of REDD
- These reduce the effectiveness of REDD
- Remote sensing is instrumental in reducing demand-side risk – “buyers” know what they are getting
- Allows policies to be designed accordingly

$= REF_i - \{E[BAU_i] + e_{BAU,i}\}$

Challenges ahead

- There is a push in the policy world to use forest inventories to estimate density and multiply by forest loss
- Driven by perception that is the best that can be done
- Lose spatial information – higher uncertainty in carbon content causes an economic loss
- The preliminary results presented do not include degradation nor the management/ enhancement of C stocks – the above challenges apply even more to degradation

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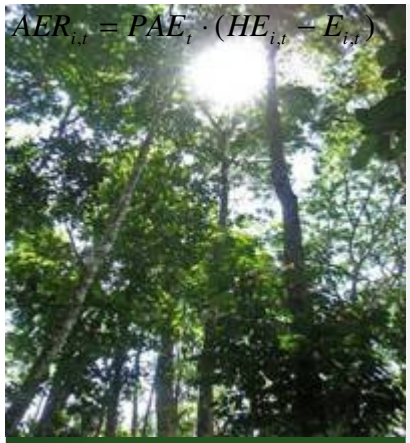

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Thank you!

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