

# **Reducing Emissions from Deforestation and forest Degradation (REDD & REDD+)**

# Forests and Climate change

- Sinks: remove CO<sub>2</sub> from the atmosphere
  - Forests and other terrestrial sinks absorb 2.6 GtC annually (AR4)
- Reservoirs: keep carbon as biomass
  - According to FAO estimates forests store about 638 GtC
- Sources: releases gases like carbon dioxide and methane when forests are destroyed
  - Deforestation and other land-use activities emit 1.6 GtC annually (AR4)
  - Forest sector, mostly deforestation, accounts for 17 % of the total anthropogenic GHG emissions
- Affected by climate change and a possible option for adaptation.
  - In turn leads to emission

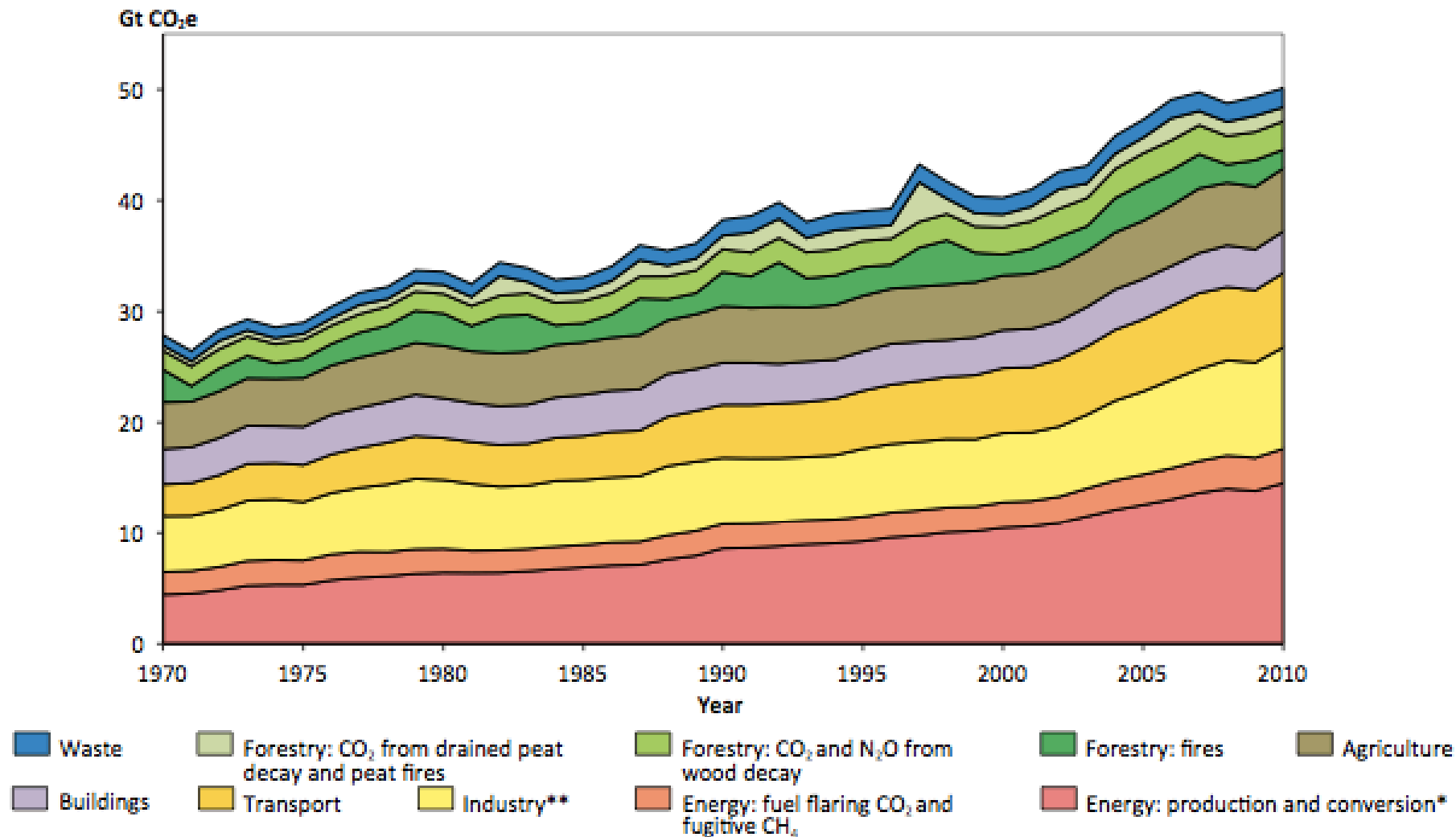
# Causes of deforestation

## Direct causes

- Agricultural/ bioenergy expansion
- Wood extraction/ logging
- Infrastructure development

## Underlying causes

- Macroeconomic factors
- Governance factors
- Political factors
- Technological factors
- Cultural factors
- Demographic factors



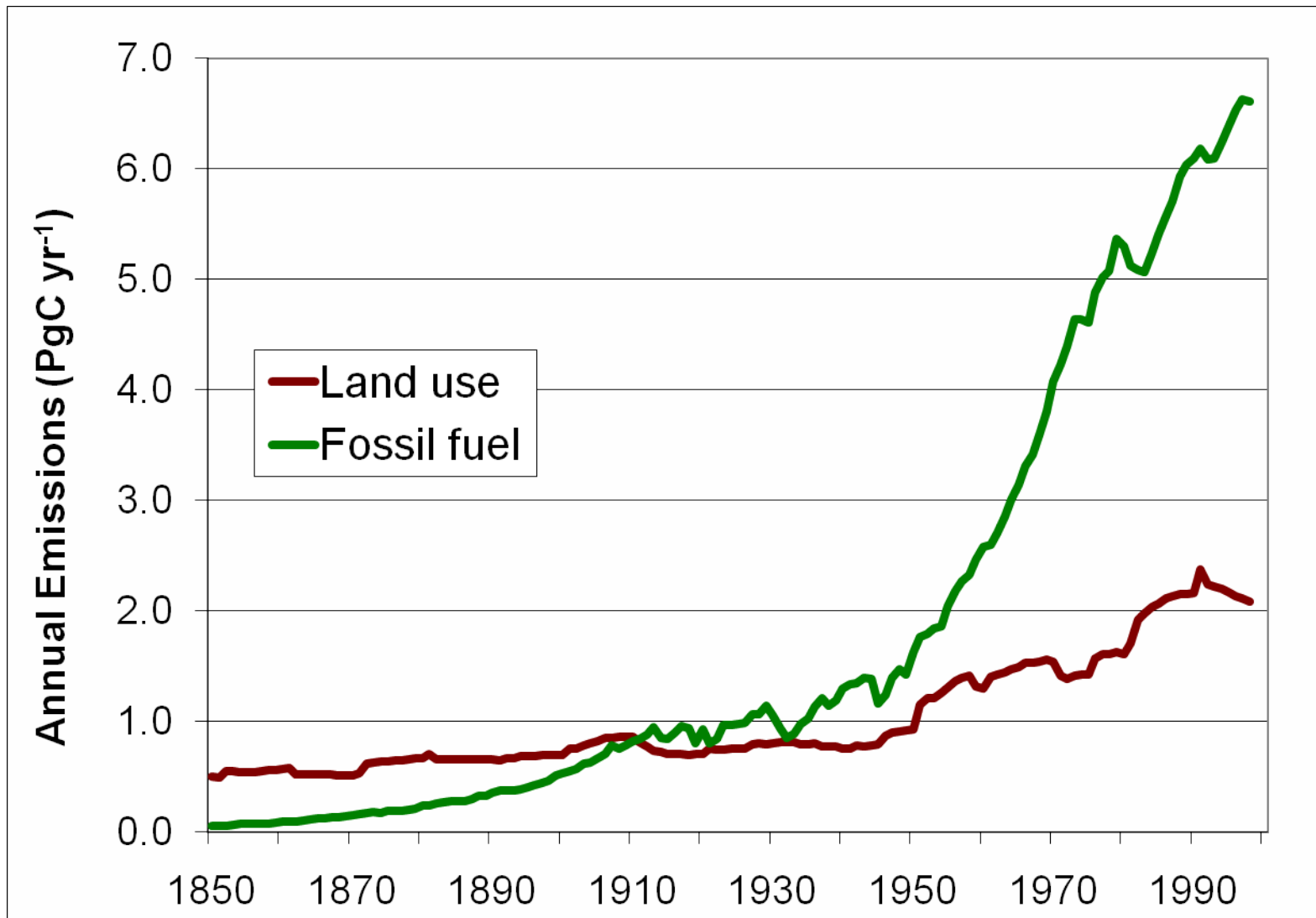
\* Power generation, refineries, coke ovens, etc.

\*\* Including non-combustion CO<sub>2</sub> from limestone use and from non-energy use of fuels and N<sub>2</sub>O from chemicals production.

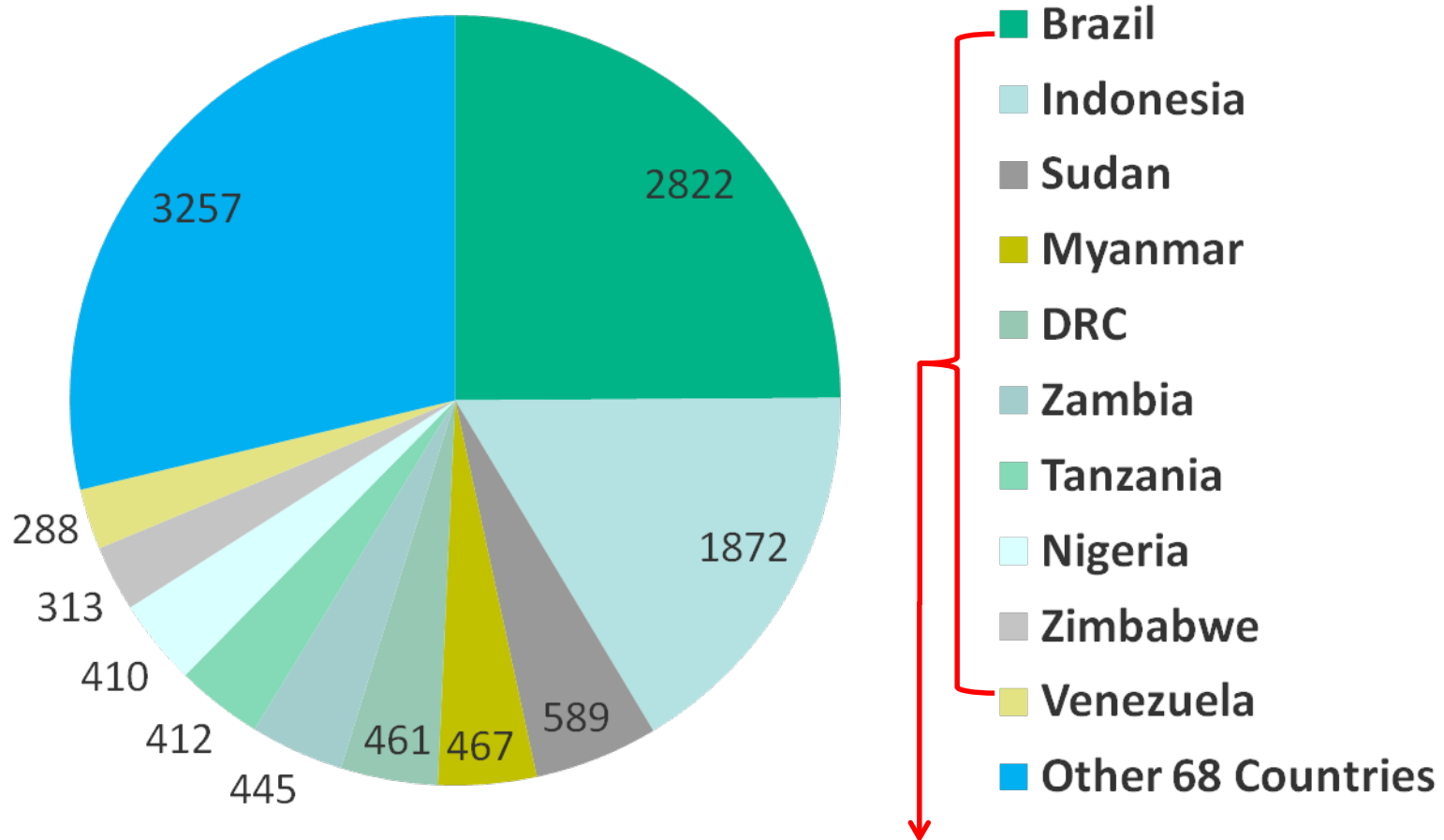
**Figure 2.1.** Trend in global greenhouse gas emissions 1970-2010 by sector (using Global Warming Potential values as used for UNFCCC/Kyoto Protocol reporting). This graph shows emissions of 50.1 GtCO<sub>2</sub>e in 2010, as derived from bottom-up emission inventories (see Section 2.2.1). An alternative estimate of 2010 emissions of 49 GtCO<sub>2</sub>e from the modeling groups is used elsewhere in the report.

Source: IRC/PRI (2012) (EDGAR 4.2 FT2010)

# Global emissions (1850-2000)



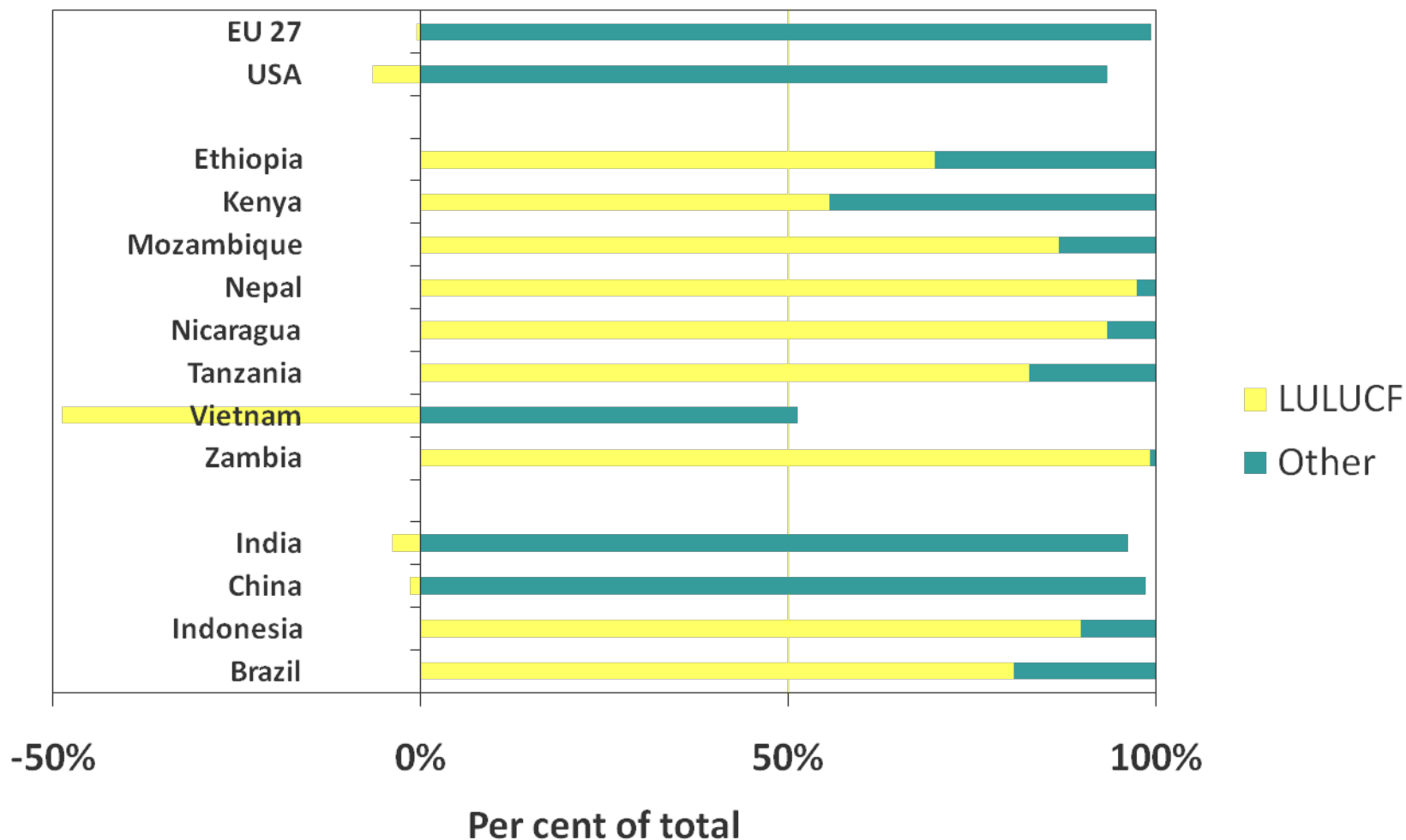
# Annual average deforestation rate (1000 ha/year) in 2000-2005



Data: FAO

10 countries: 71% of total

# Total CO2 emissions from land-use and other sectors in selected countries (2000)



Data: WRI

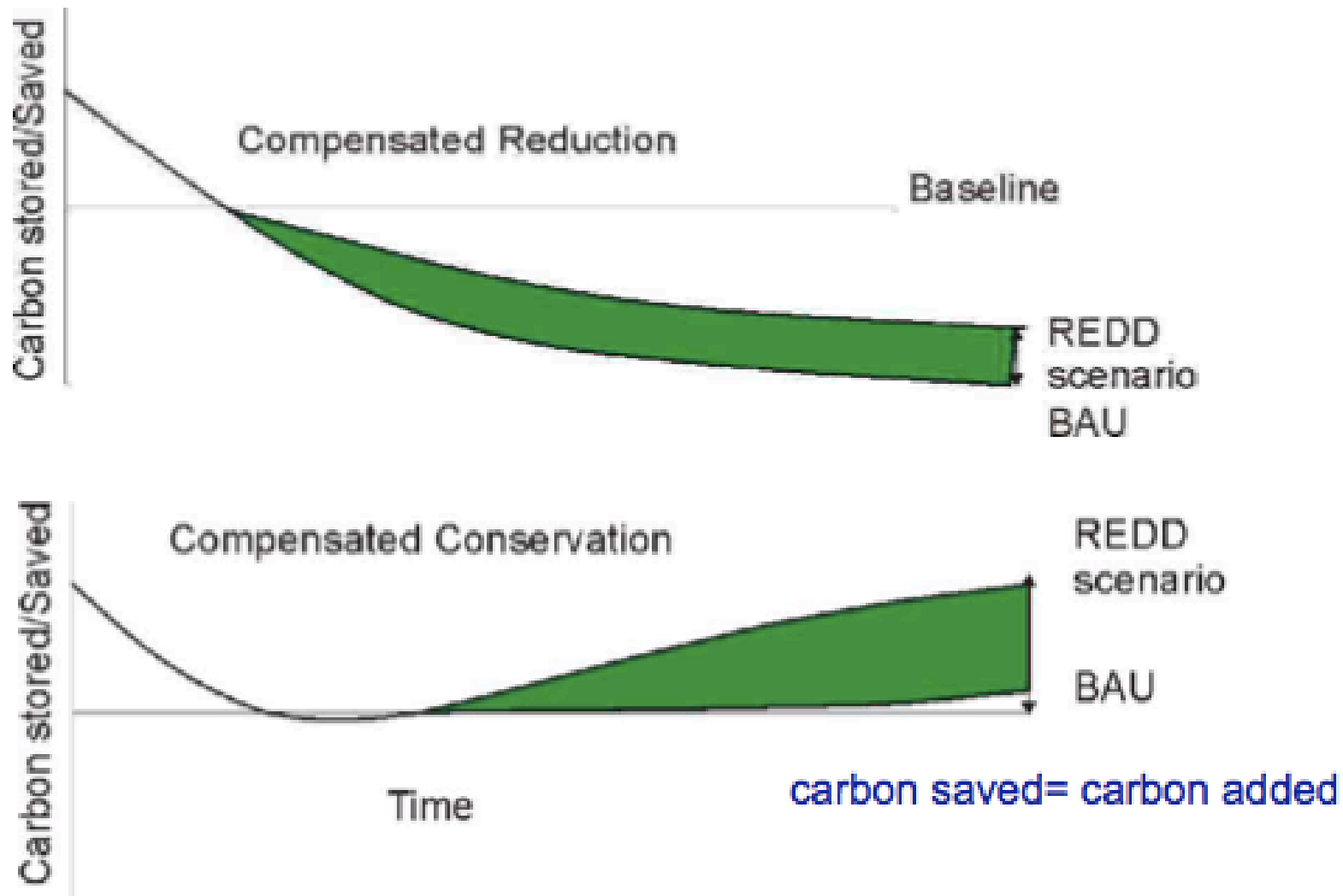
# Background

- The Kyoto Protocol only addresses afforestation and reforestation (A/R) to enhance the sink of GHG emissions
- Avoiding deforestation (AD) was not included because countries have different circumstances in LULUCF sector, hence equity was an issue
- A/R through CDM has not been very promising
- In fact, addressing AD would address 20% of the global emissions which is equivalent to 1.6 billion tons of carbon per year (1.6 Gt C/y)



# History of REDD

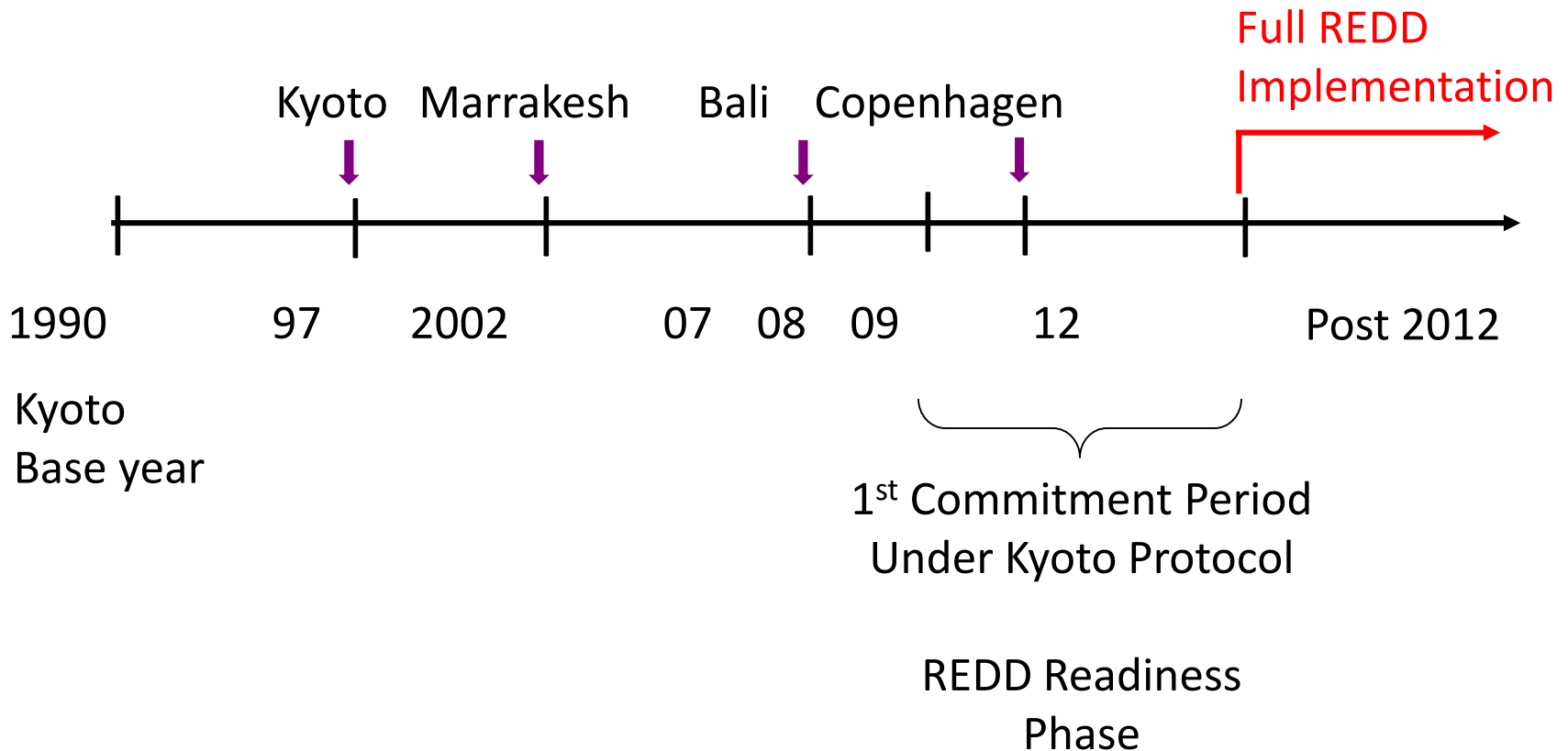
- Submissions of the Governments of PNG and Costa Rica (FCCC/CP/2005/MISC.1)
- COP11 initiated a 2-year process of reducing emissions from deforestation - RED (FCCC/CP/2005/L.2)
- SBSTA invited submissions from Parties and Observers to stimulate actions
- The second “D” (forest Degradation) was considered in COP13
- SBSTA organized workshops
  - Rome, September 2006
  - Cairns, March 2007
  - Tokyo, May 2008
  - Bonn, October 2008
- Compensated Conservation suggested by India (2007) and supported by others
- REDD was broadened to REDD+ in early 2009



Source: ICFRE, 2007



# Time frame of the UNFCCC Processes



# Bali Action Plan (COP 13)

The Bali Action Plan calls for:

“Policy approaches and positive incentives on issues relating to reducing emissions from deforestation and forest degradation in developing countries; and the role of **conservation, sustainable management** of forests and **enhancement** of forest carbon stocks in developing countries;” [*FCCC/CP/2007/6/Add.1, 14 March 2008; Decision 1/CP.13 [BAP], paragraph 1(b)(iii)*]

# Bali road map: Indicative guidance (1/2)

- Demonstration activities should be undertaken with the approval of the host Party;
- Estimates of reductions or increases of emissions should be results based, demonstrable, transparent, and verifiable, and estimated consistently over time;
- The use of the methodologies is encouraged as a basis for estimating and monitoring emissions;
- Emission reductions from national demonstration activities should be assessed on the basis of national emissions from deforestation and forest degradation;
- Sub-national demonstration activities should be assessed within the boundary used for the demonstration, and for associated displacement of emissions;

# Bali road map:

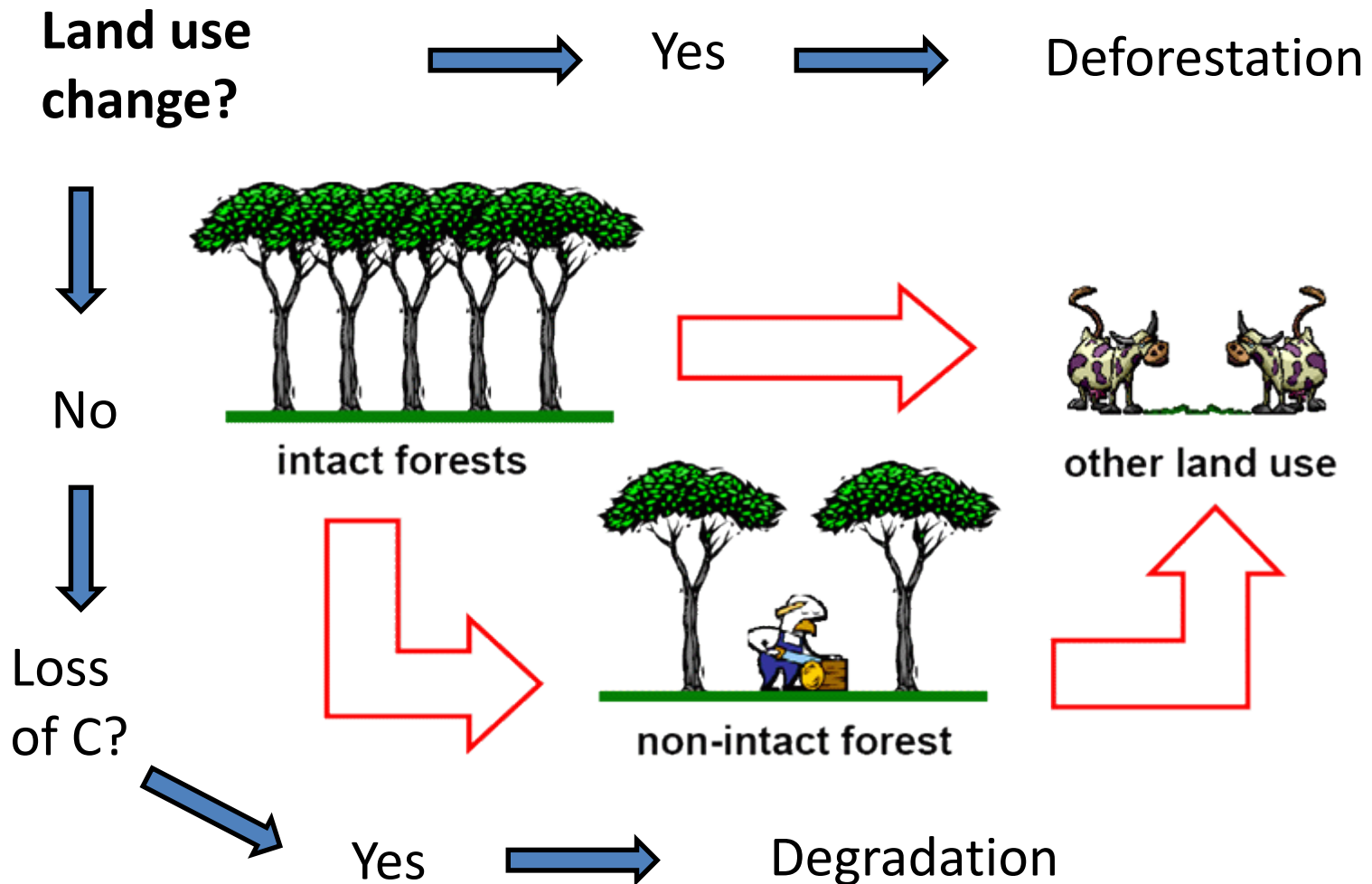
## Indicative guidance (2/2)

- Reductions in emissions or increases resulting from the demonstration activity should be based on historical emissions, taking into account national circumstances;
- Sub-national approaches, where applied, should constitute a step towards the development of national approaches, reference levels and estimates;
- Demonstration activities should be consistent with sustainable forest management and considers the relevant provisions of the United Nations Forum on Forests, United Nations Convention to Combat Desertification and the Convention on Biological Diversity;

# Definitions

- Note! No definition has been approved to be used REDD+ in current negotiations. The following definitions are from the Kyoto Protocol or from the IPCC
- **Forest** is defined structurally on the basis of crown cover percentage, minimum height and minimum area of stand:
  - Forest area between 0.05 and 1 ha
  - Potential to reach a minimum height at maturity in situ of 2 to 5 m
  - Tree crown cover (or equivalent stocking level): 10 to 30 %*(Decision 19/CP.9) - Kyoto Protocol definition*
- **Deforestation** is defined as the direct, human-induced conversion of forested and to non-forested land  
*(Decision 11/CP.7) - Kyoto Protocol definition*
- **Degradation** is defined as a direct, human-induced, long-term loss (persisting for X years or more) or at least Y% of forest carbon stocks [and forest values] since time T and not qualifying as deforestation. The parameters X,Y and T have not been defined (Penman et al., 2003) - *IPCC definition*

# Deforestation and degradation





# What is REDD?

- **Basic idea is simple:** “Developing countries willing and able to reduce their deforestation rate keyed to a reference time period will receive financial compensation. Transfers will be based either on foregone opportunity costs or on the value of carbon market prices.”
- **New (last?) opportunity:** Previous global approaches to curb deforestation have been unsuccessful. REDD provides a new framework to break this trend.
- **Objectives:** Primarily emissions reductions...but has the potential to deliver a range of “co-benefits” e.g. poverty alleviation in forest areas, biodiversity conservation...

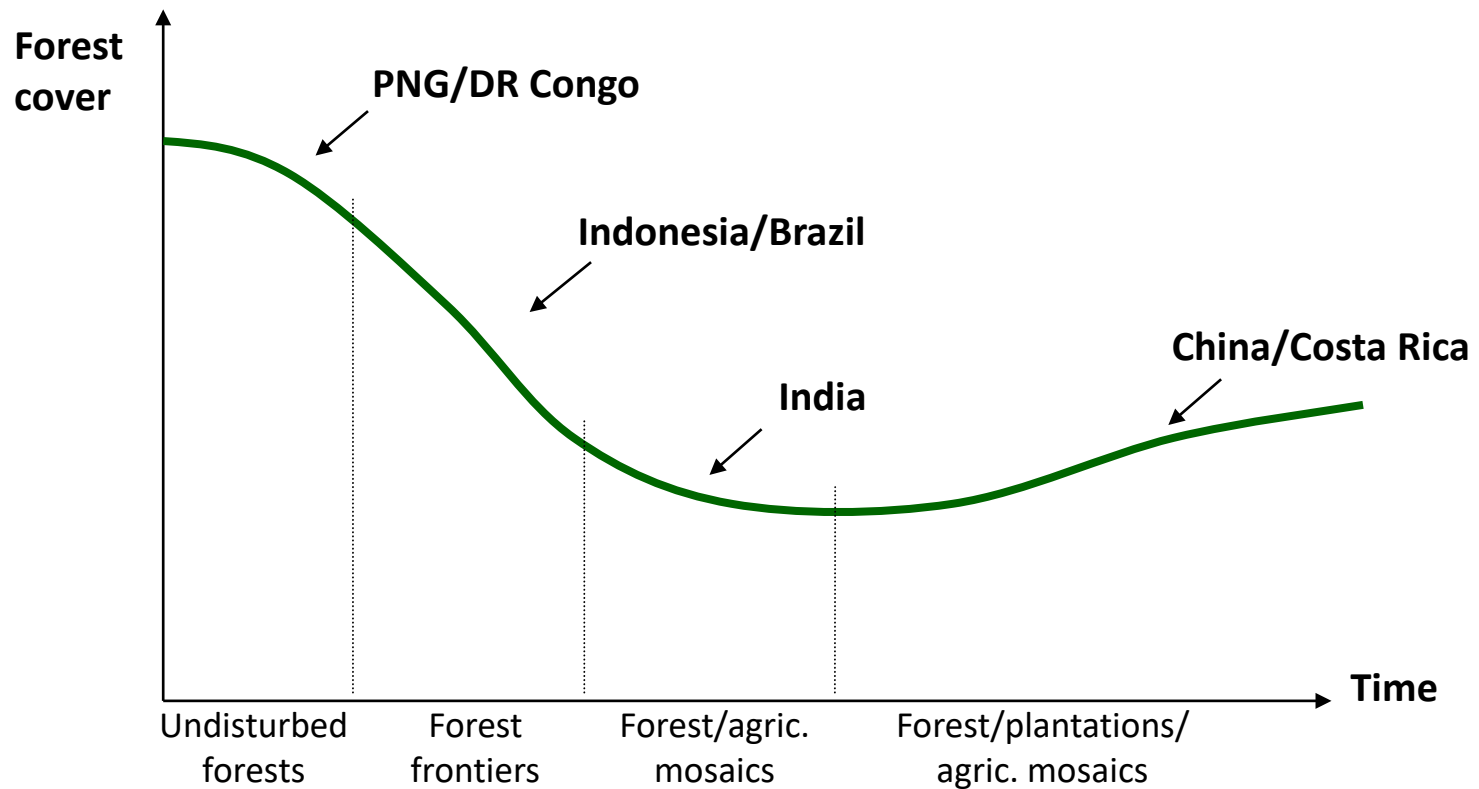
# What is REDD plus?

- As defined in BAP: **conservation, sustainable management** and **enhancement** of carbon stocks.
- Plus activities came into greater prominence since Bonn 2009.
- Plus activities are not directly linked to emissions reductions.
- Rather, a call for funding/investment for tropical forests, which store carbon, increase sequestration, create rain, moderate weather conditions and protect biodiversity.
- Most mechanisms and funding options, however, are still trying to deal with the question of 'perverse' incentive.

# Mitigation options under REDD/REDD plus

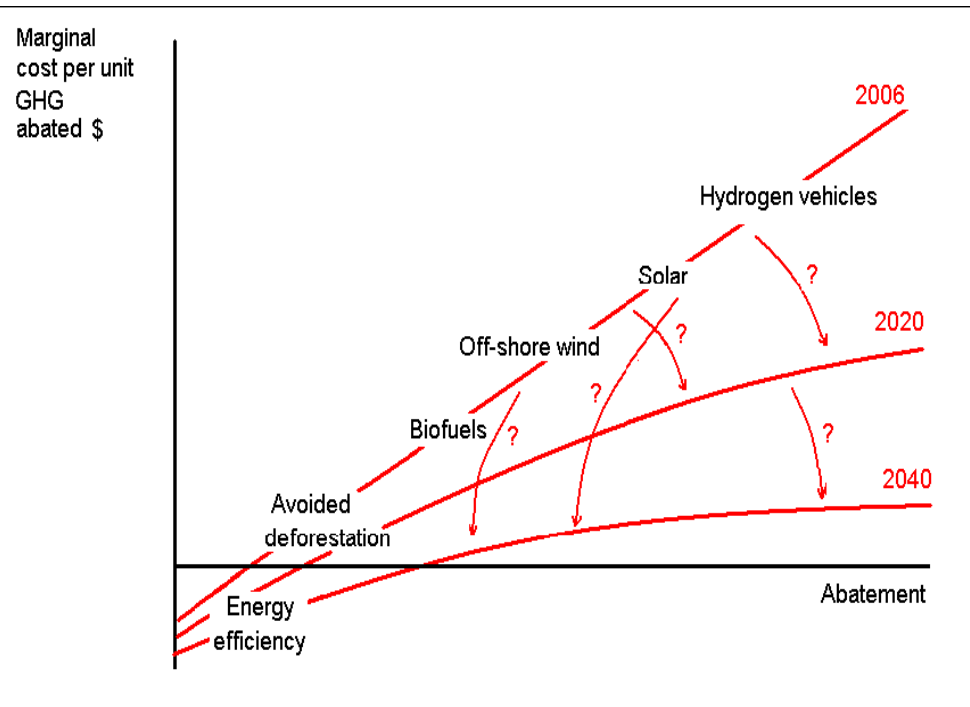
<i>Mitigation Options</i>	<i>Objective</i>	<i>Policy instrument</i>	<i>Activities</i>
<b>Reducing GHG Emissions</b>	<b>Reducing deforestation</b>	<b>REDD (first D)</b>	<b>Maintaining existing carbon pools through, law enforcement, governance reforms, tenurial reforms, SFM, payments for environmental services</b>
	<b>Reducing degradation</b>	<b>REDD (second D)</b>	<b>Maintaining existing carbon pools/restoring lost carbon pools through SFM, PES in the form of credits for carbon sequestered/emission avoided</b>
<b>Increasing Sequestration</b>	<b>Enhancing existing forests/increasing forest cover</b>	<b>REDD+</b>	<b>Restoring lost carbon pools &amp; creating new carbon pools in forest areas</b>
	<b>Creating new forests</b>	<b>CDM A/R</b>	<b>Creating new carbon pools Agroforestry and Plantations</b>

# Forest transition



Source: Kanninen et al. (2007)

# Why include REDD in a global climate regime ?

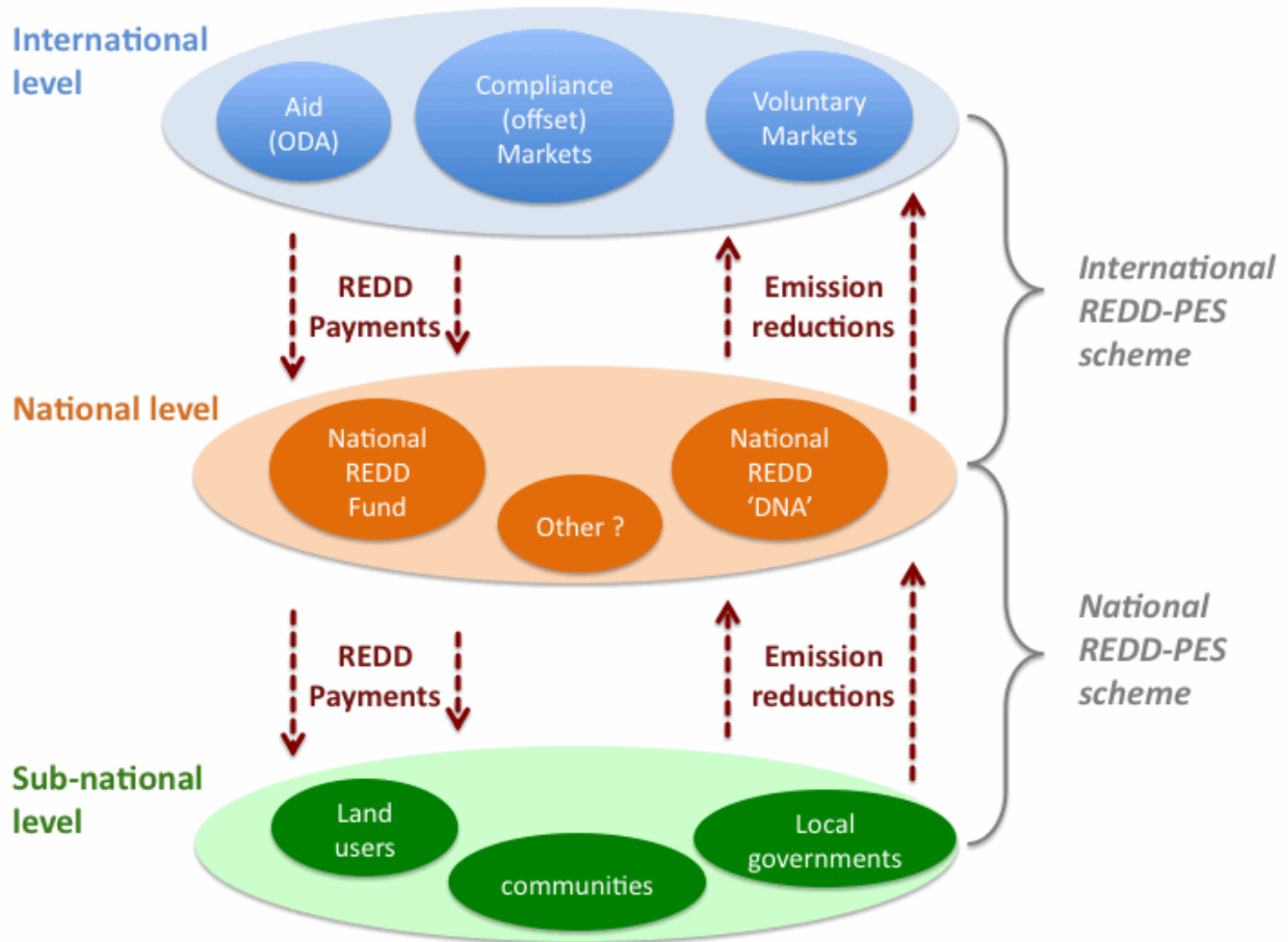


- BIG:
  - 1/5 of GHG emissions, but
  - not included in global climate regime
- CHEAP: (Stern report)
  - Negative - \$5/ton
  - 50 % red: USD 5-15 billion
  - But problems of implementation (transaction costs)
- QUICK:
  - Stroke of pen reforms
  - No deep restructuring of economy or new technology
  - A wooden bridge to a clean energy future
- WIN-WIN:
  - Large transfer
  - Good governance?

## Why include ... (cont.)

- Initiated by developing countries
- Less resistance from environmental groups
- Poor countries: an opportunity to receive large transfers (sell carbon credits)
- Rich countries: a cheap way to undertake mandatory reductions

# The “ideal” REDD scheme



# Key issues and implications





## **Moving Ahead with REDD:**

issues, options and implications



*Edited by  
Arild Angelsen*

## Key messages:

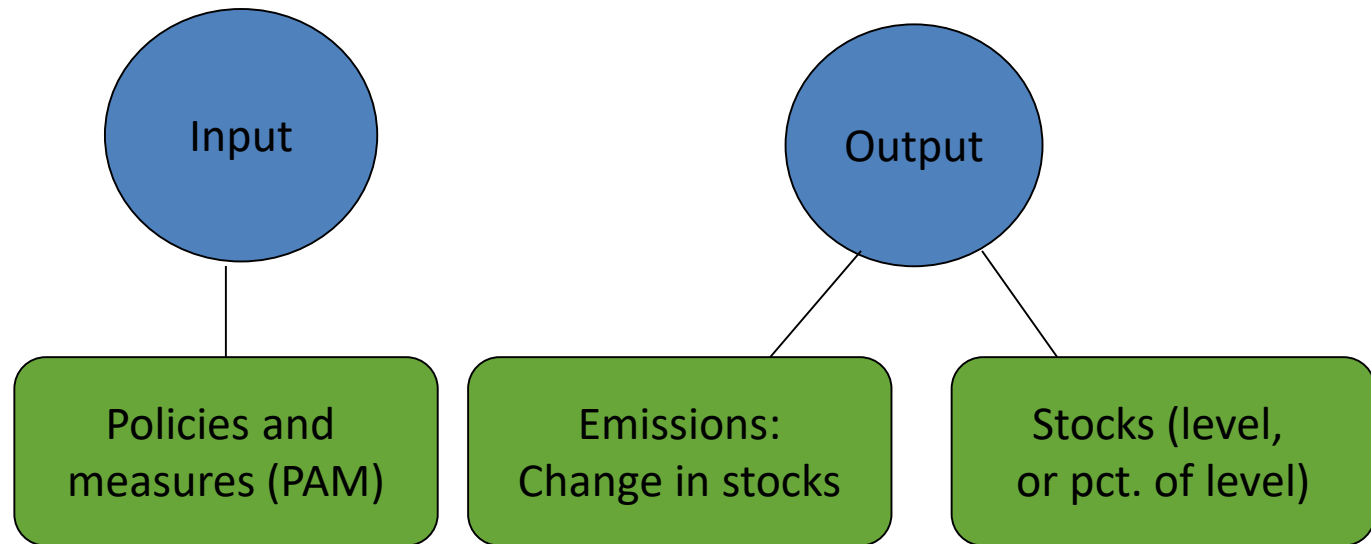
- Technical solutions exist, but
- Often trade-offs
- Political issues
- Flexibility needed:
  - Country circumstances
  - Learning process

# Challenge 1: Scope of REDD

Changes in:	Reduced negative change	Enhanced positive change
Forest area (hectare)	Avoided deforestation	Aforestation & reforestation (A/R)
Carbon density (carbon per hectare)	Avoided degradation	Forest regeneration & rehabilitation (carbon stock enhancement)

Forest carbon (C) = forest area (ha) \* carbon density (C/ha)

# Challenge 2: What to credit?



Strong arguments for emission based approach:

- Incentives should aim at the target
- Generate tradable REDD credits (tap into compliance market)

Problems with stock based approach:

- Water out the mechanism, incentives at the margin
- Low additionality

## Challenge 3: One or two baskets? (Integration with broad post-2012 climate regime)

- This is more a question of funding and fungibility (REDD used as offsets)
- Arguments for inside:
  - Tap into compliance market
  - REDD inclusion -> more ambitious global targets
- Arguments for outside:
  - Market flooding, REDD not being additional

# Challenge 4: Finding the right scale? Credit to countries, projects or both?

## National approach

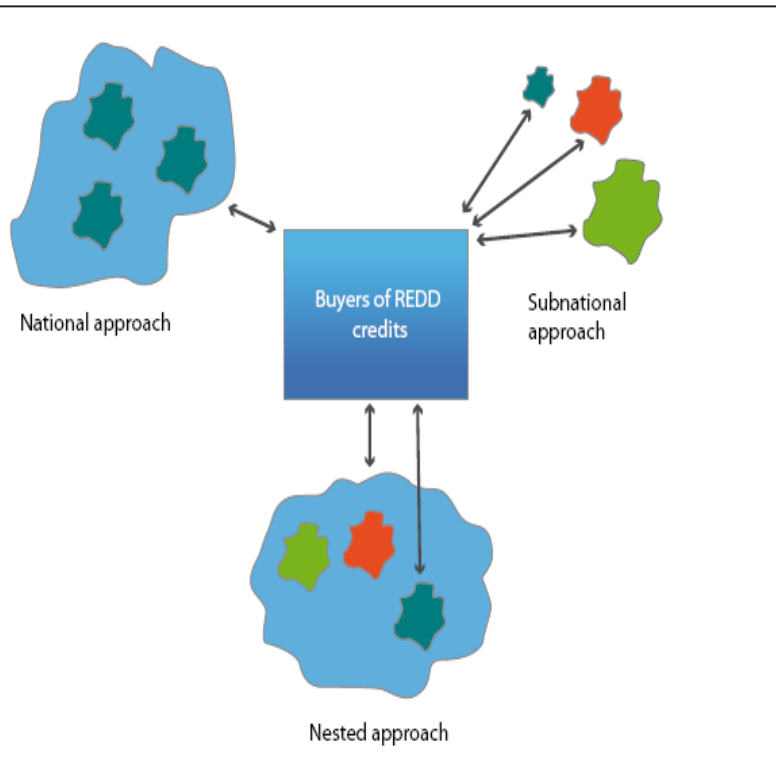
- Creates country ownership
- Addresses domestic leakage
- Susceptible to governance failures
- Less likely to mobilize private investment

## Sub-national approach

- Allows early action and wide participation
- Susceptible 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

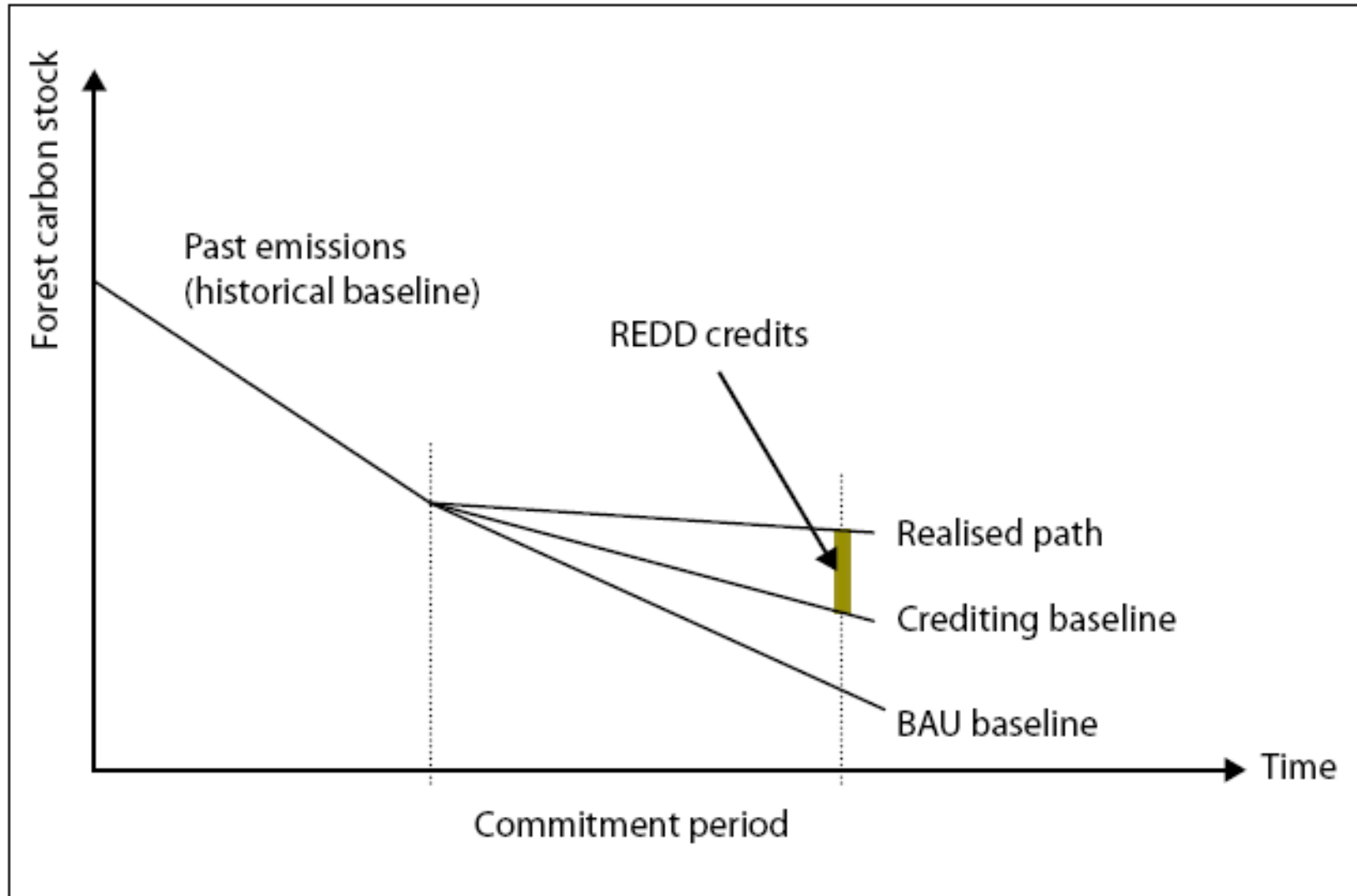


# Challenge 5: Finding the money (e.g. USD 15 billion annually for 50 % cut)

1. Development aid or public funds
2. Voluntary markets
3. Compliance markets
  - a. Selling REDD credits (fungibility)
  - b. Auctioning of Emission Allowances
  - c. Tax on carbon trade

Markets	Volume (MtCO <sub>2</sub> e)		Value (US\$million)	
	2006	2007	2006	2007
Voluntary OTC Market	14.3	42.1	58.5	258.4
CCX	10.3	22.9	38.3	72.4
<b>Total Voluntary Markets</b>	<b>24.6</b>	<b>65.0</b>	<b>96.7</b>	<b>330.8</b>
EU ETS	1,044	2,061	24,436	50,097
Primary CDM	537	551	5,804	7,426
Secondary CDM	25	240	445	5,451
Joint Implementation	16	41	141	499
New South Wales	20	25	225	224
<b>Total Regulated Markets</b>	<b>1,642</b>	<b>2,918</b>	<b>31,051</b>	<b>63,697</b>
<b>Total Global Market</b>	<b>1,667</b>	<b>2,983</b>	<b>31,148</b>	<b>64,028</b>

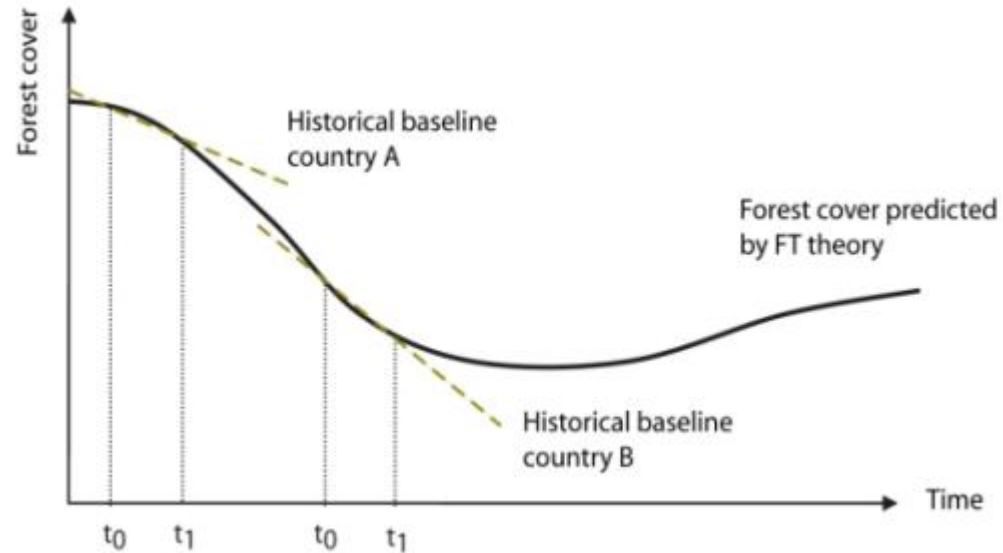
# Challenge 6: Setting the reference levels (what to pay for)



# Reference levels (cont.)

## Business as usual (BAU)

- National historical deforestation
- National circumstances Forest cover-stage in forest transition
- GDP/capita



## Crediting baselines:

- BAU + common but differentiated responsibilities
- No-lose systems (Crediting baseline < BAU):
  - Who owns the REDD rent?

➔ In the end: a balance between the risk of 'tropical hot air' and REDD participation and acceptability



# Challenge 7: Avoiding leakage (emission displacements)

A serious issue - how to deal with that?

- **Monitor:** The Voluntary Carbon Standard for land-use projects and the BioCarbon Fund now recommend leakage-belt monitoring, e.g. areas five to seven times the size of project areas greater than 100,000 ha and 20 to 40 times the size of smaller ones (<100,000 ha)
- **Increase Scale:** Move from sub-national to national levels. For international leakage: get broad participation
- **Discount:** The various UNFCCC-proposed mechanisms, such as banking non-credited conservation reserves, insurances, discounted credits, or leakage-adjusted baselines and targets. Reward better monitoring
- **Redesign:** how large are leakage risks for different on-the-ground REDD actions? Priority to less mobile deforesting agents?
- **Neutralize:** Example: neutralizing 'alternative livelihoods' components, cf. Integrated Conservation and Development Projects
- Leakage a sign of a healthy economy
- Must accept some leakage
- Move to national level

# Challenge 8: Ensuring permanence and assigning liability

Is permanence a particular REDD problem?

- Difficult to control the carbon storage (e.g. fire)
- Continued monitoring and incentives

But:

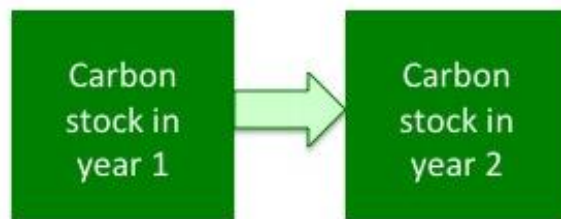
- Given the finiteness of fossil fuels, it is likely that they will anyway end up in the atmosphere over the long run
- Even in case terrestrial carbon sequestration was in fact temporary, it will still have a positive climate effect: “A wooden bridge to a clean energy future”

The real problem:

- Lack of national caps & targets (and liability for those)
- -> Liability management schemes needed as part of REDD

# Challenge 9: Monitoring, reporting and verifying (MRV)

Stock-difference approach



$$\Delta C = (C_{t_2} - C_{t_1}) / (t_2 - t_1)$$

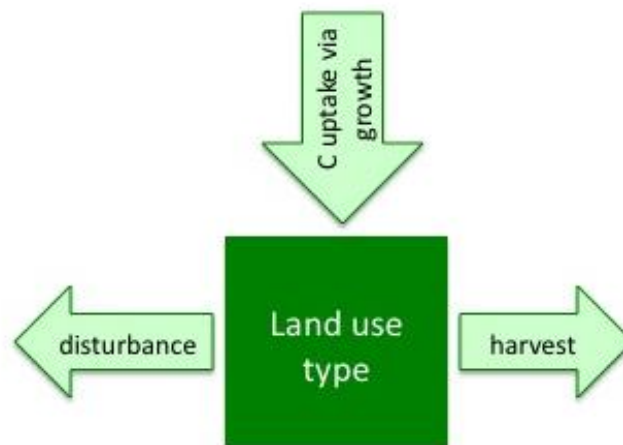
Where:

$\Delta C$  = annual carbon stock change in pool (t C/yr)

$\Delta C_{t_1}$  = carbon stock in pool at time  $t_1$  (t C)

$\Delta C_{t_2}$  = carbon stock in pool at time  $t_2$  (t C)

Gain-loss approach



$$\Delta C = \Delta C_{\text{gain}} - \Delta C_{\text{loss}}$$

Where:

$\Delta C$  = annual carbon stock change in pool (t C/yr)

$\Delta C_{\text{gain}}$  = annual gain in carbon (t C/ yr)

$\Delta C_{\text{loss}}$  = annual loss in carbon (t C/ yr)

# MRV (cont.)

- The technologies are (almost) there
- But they come at a cost, sometimes a very high cost
- The more disaggregated data, the more expensive
- MRV not an hindrance for moving ahead, but impose limitations for what we can do
- IPCC guidelines fairly good for deforestation, less developed for degradation
- Conservativeness principle
- A global REDD scheme flexible enough to avoid discriminating against countries with low MRV capacity
- Reward better MRV (e.g. the level of discounting)

# Challenge 10: How to deal with degradation?

## Should we include degradation (“second D”)?

- Opposing views on whether or not it should be included
- More complicated to de define, measure and monitor than deforestation
- With degradation, REDD would more effective in achieving the goals of the convention by accounting for a wider range of forest greenhouse gas emissions
- Inclusion of degradation increases international equity of the REDD mechanism by encouraging participation by a wider range of countries, many of them in Africa
- Inclusion allows for promotion of sustainable forest management, rehabilitation and restoration
- Leaving degradation out can lead to increased leakage

# Challenge 11: Generating REDD co-benefits

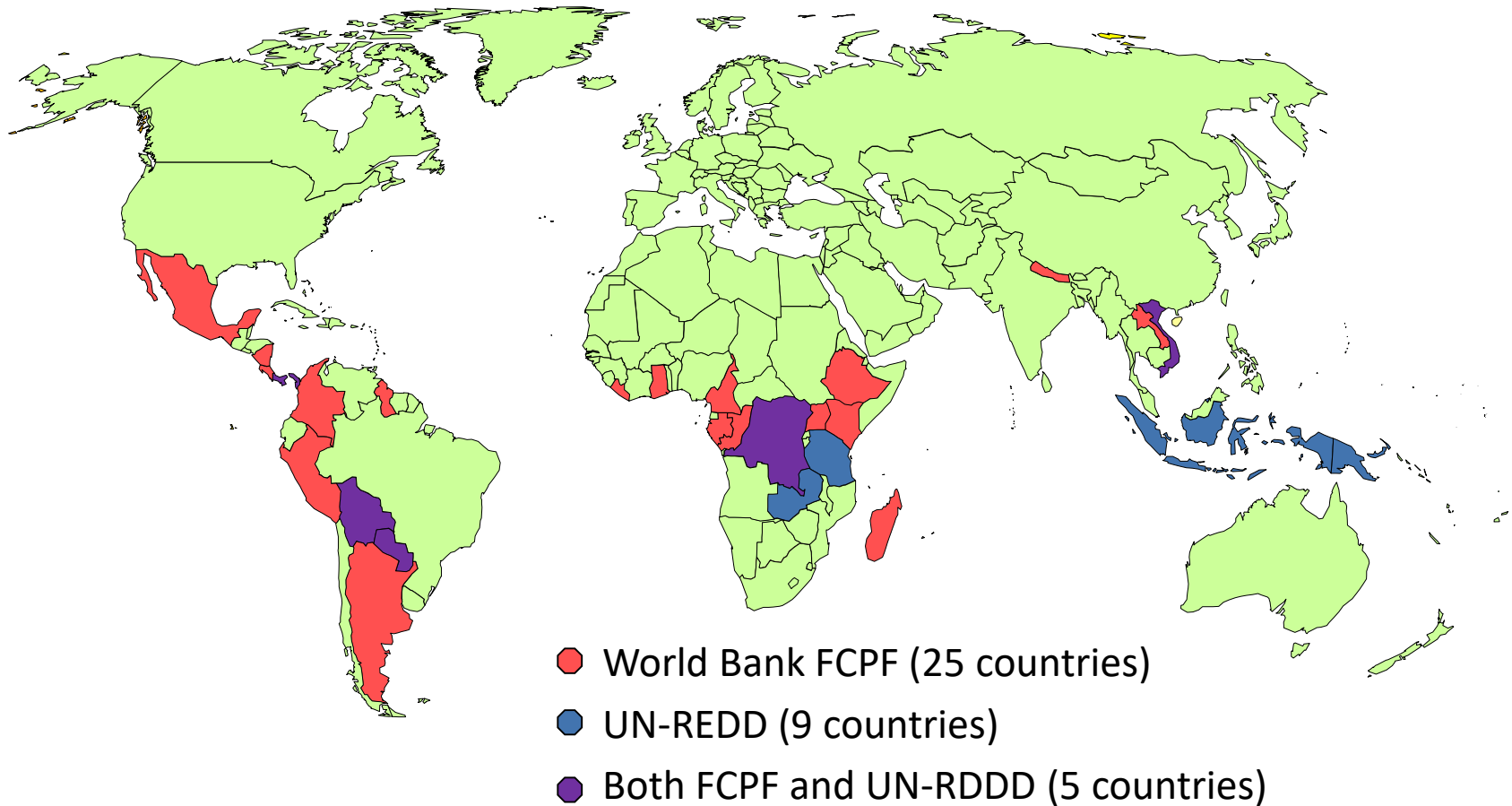
## Why Should REDD be Pro-poor?

- Moral arguments: Legitimate rights
- Practical considerations: forest users/managers are often poor, and need incentives
- Risk reduction: risk of local rejection, social conflict
- Attractiveness of REDD investments greater, e.g. CSR
- Political considerations: REDD funds from international donors and development agencies
- Procedural matters: The UNFCCC recognises the importance of social issues, including poverty, as global priorities (Decision 2/CP.13).

# Co-benefits (poverty, rights, biodiversity)

- Opportunities of poor country participation:
  - Nested approach, soft entry
  - Readiness, ODA funding
  - “National circumstances” – a challenge
- Recognize other international conventions (CBD, Aarhus)
- Some tradeoffs carbon effectiveness and equity
- Mainly determined by national REDD strategies

# FCPF and UN-REDD



## FCPF Donors

Australia, Finland, France, Germany, Japan, the Netherlands, Norway, Spain, Switzerland, UK, and USA



# Forest Carbon Partnership Facility (FCPF)

- A \$100 million Readiness Mechanism to provide grants to 20 countries that would fund projects including:
  - a) measurement, monitoring and verification systems to enable countries to report on emissions
  - b) adopting a national REDD strategy that reflects each country's priorities
  - c) developing a national reference scenario for REDD
- A \$200 million Carbon Finance Mechanism (to be spent over ~5 years, beginning in 2010) to allow some of these countries to run pilot programs earning credits for deforestation

# FCPF Readiness Plan Idea Note (R-PIN) submissions (14)

## Africa (6)

- Democratic Republic of Congo
- Gabon
- Ghana
- Kenya
- Liberia
- Madagascar

## Latin America (5)

- Bolivia
- Costa Rica
- Guyana
- Mexico
- Panama

## Asia (3)

- Nepal
- Lao PDR
- Vietnam

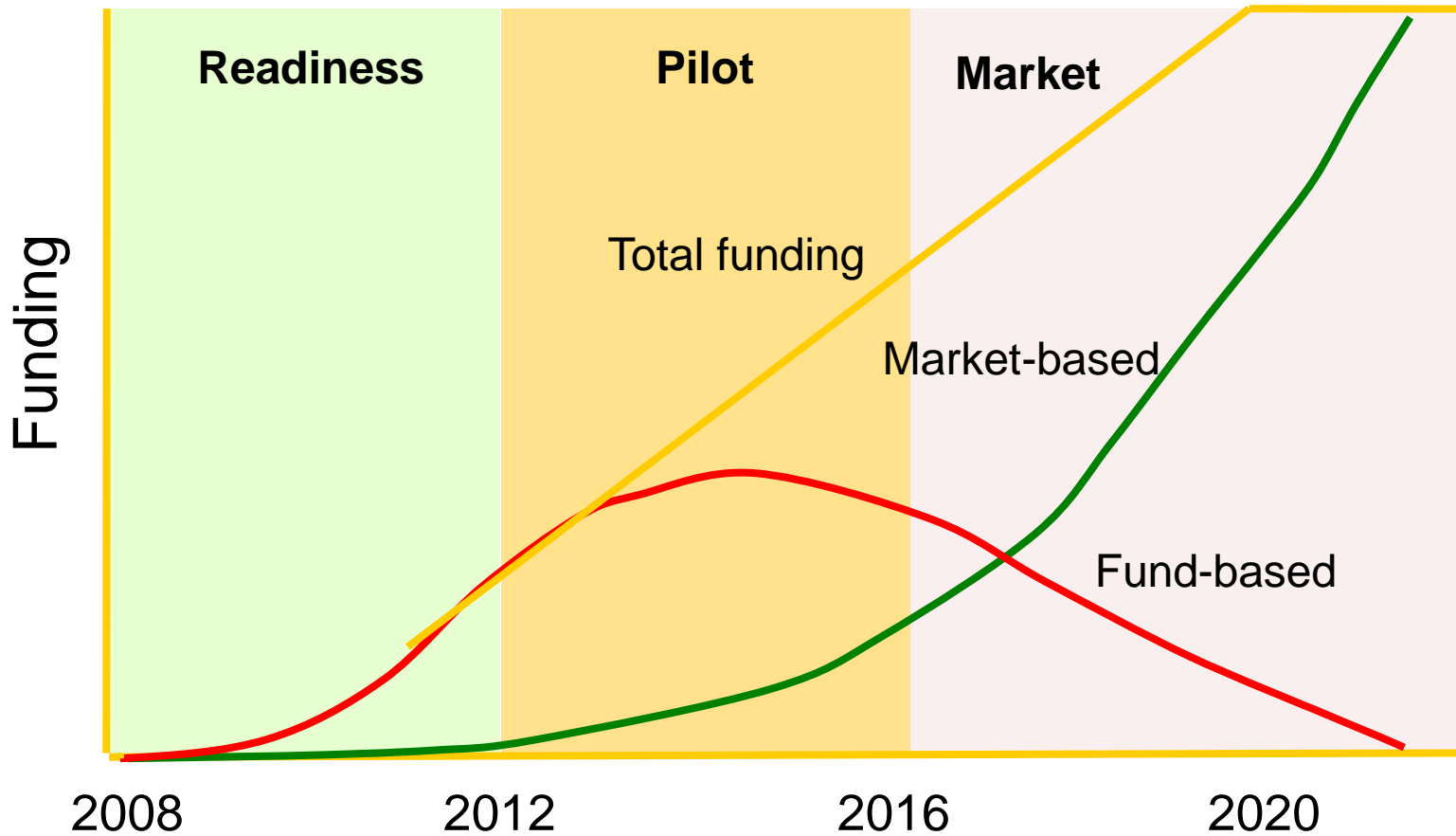
# UN-REDD

- FAO, UNDP and UNEP - a joint UN Collaborative Program on REDD in developing countries
- Two elements:
  - Assisting developing countries to prepare and implement national REDD strategies and mechanisms,
  - Supporting the development of normative solutions and standardized approaches for a REDD instrument linked with the UNFCCC
- Readiness program:
  - Development of monitoring and assessment capability and methodologies
- Main donor: Norway

# FCPF and UN-REDD countries

	<b>High Deforestation Rate (&gt; 0.5% year)</b>	<b>Low Deforestation Rate (&lt; 0.5% year)</b>
<b>High Forest Cover (&gt; 40%)</b>	Indonesia, PNG, Lao PDR, Bolivia, Paraguay, Nicaragua	DRC, Republic of Congo, Colombia, Guyana, Panama, Peru, Costa Rica
<b>Low Forest Cover (&lt;40%)</b>	Nepal, Ethiopia, Ghana, Liberia, Tanzania, Uganda	Vietnam, Kenya, Madagascar, Mozambique

# Outlook: REDD funding scheme

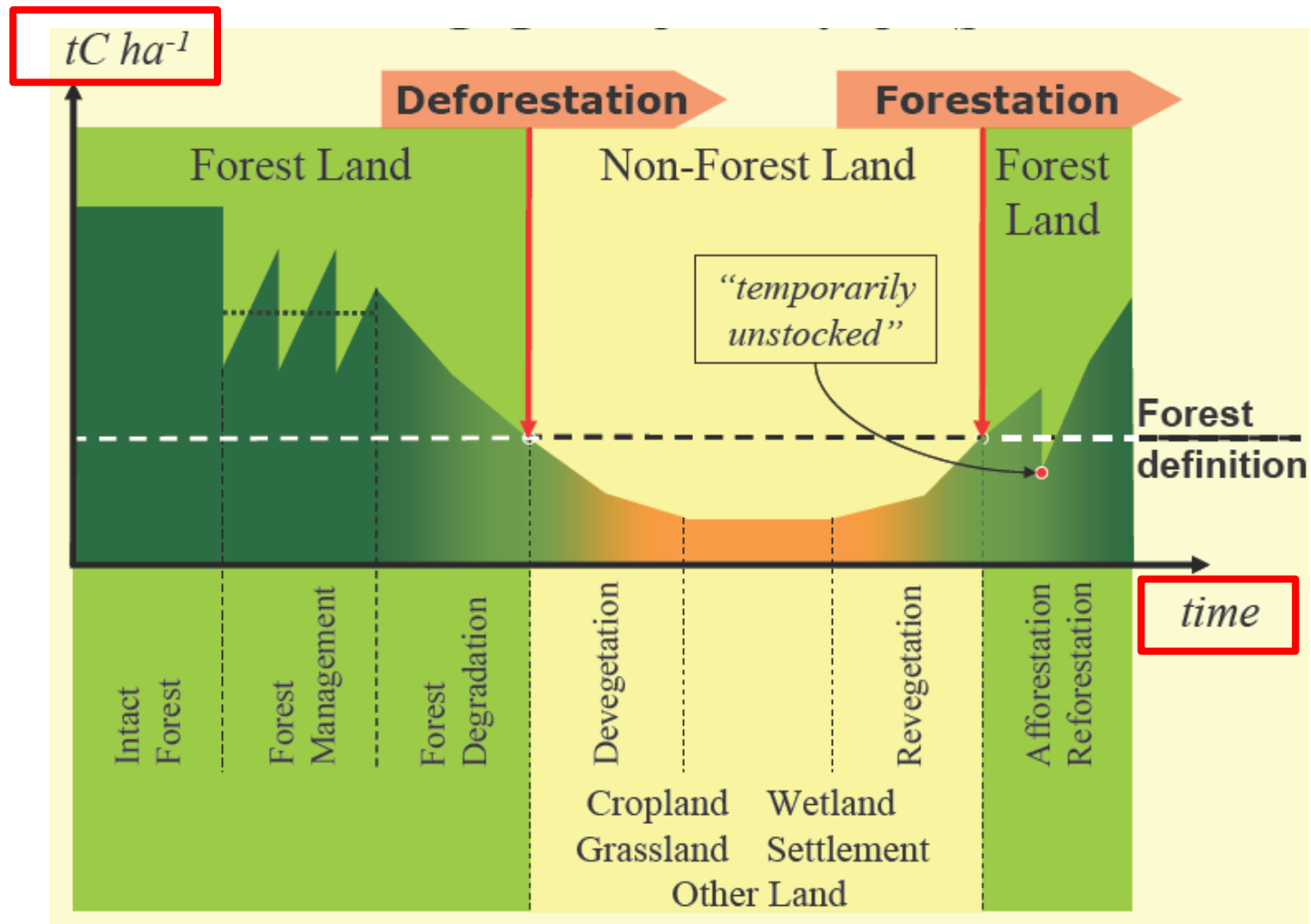


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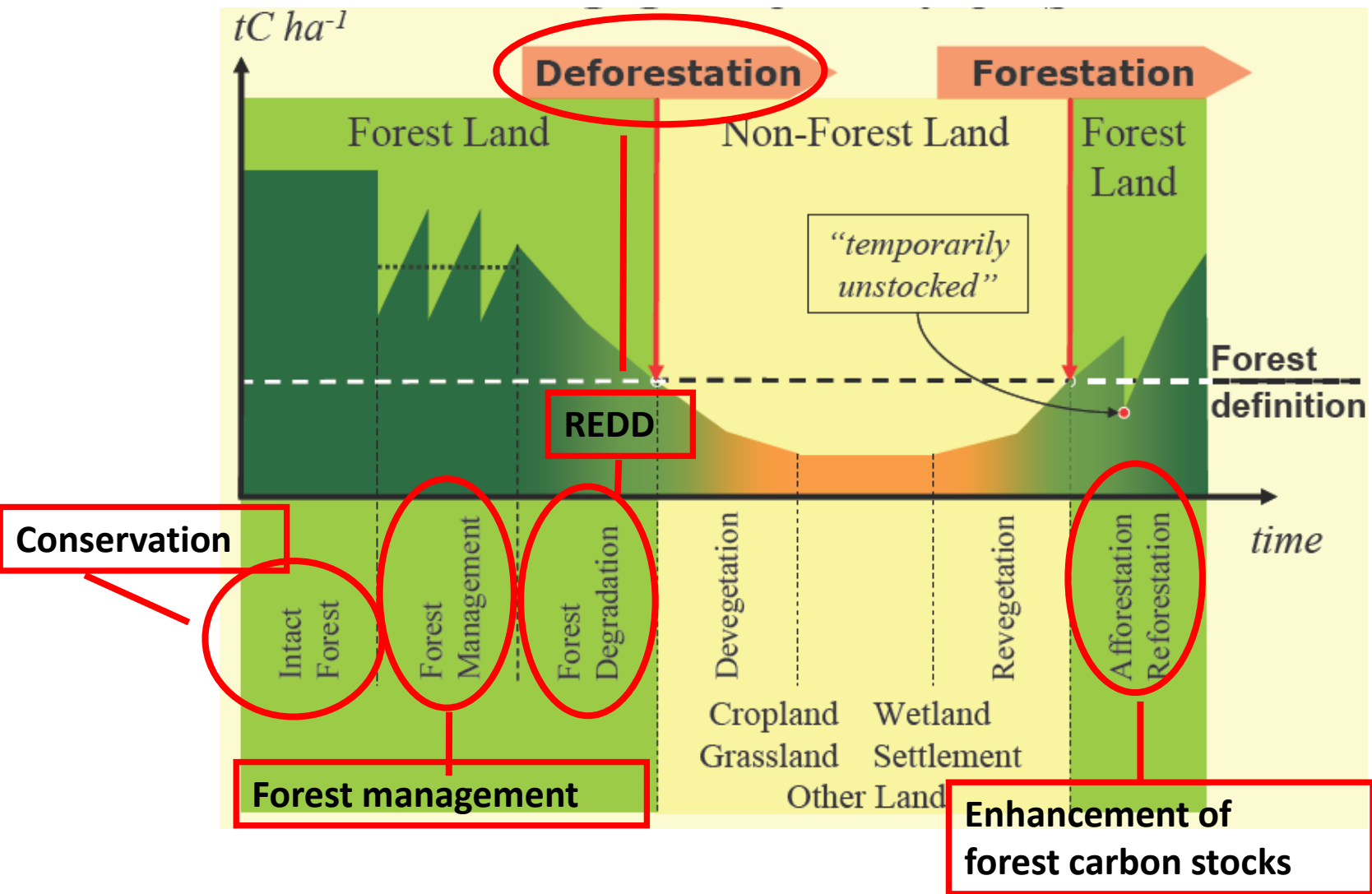
# REDD-plus (REDD+)

- There seems to be a general consensus that REDD activities are to be broadened
- New term – REDD-Plus – is launched
- REDD+ relating to
  - Reducing emissions from deforestation and forest degradation in developing countries
  - and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries

# IPCC definitions



# REDD+ using IPCC definitions





# Outlook

- Will REDD+ make it to the post 2015 agreement?
- Several demonstration activities (“planned experiments”) starting
- Start quickly to gain experience
- Phased approach:
  - MRV → more precise methods (learning by doing)
  - Projects → national level (but, quite different ball game)
  - Funds → market based mechanisms over a transition period



**Thank you for your attention**

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