The Role of Forests in Climate Change

REDD Training Course

Contents

Part 1:

What is Climate Change? And what are the signs of Climate Change?

What is Climate Change?

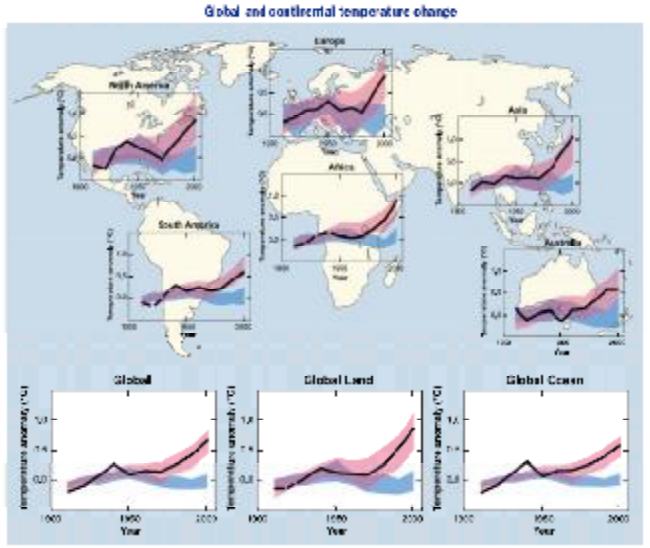
- Climate Change = Any significant change in measures of climate (such as temperature or precipitation) lasting for an extended period of time (typically decades)
- United Nations Forum Convention on Climate Change (UNFCCC) defines Climate Change as 'a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere'

Climate Change is happening

"Warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level" (IPCC Fourth Assessment Report, 2007)

"Most of the observed increase in global average temperatures since the mid 20th century is very likely due to observed increases in anthropogenic greenhouse gas concentrations" (IPCC, 2007)

Global and continental temperature change

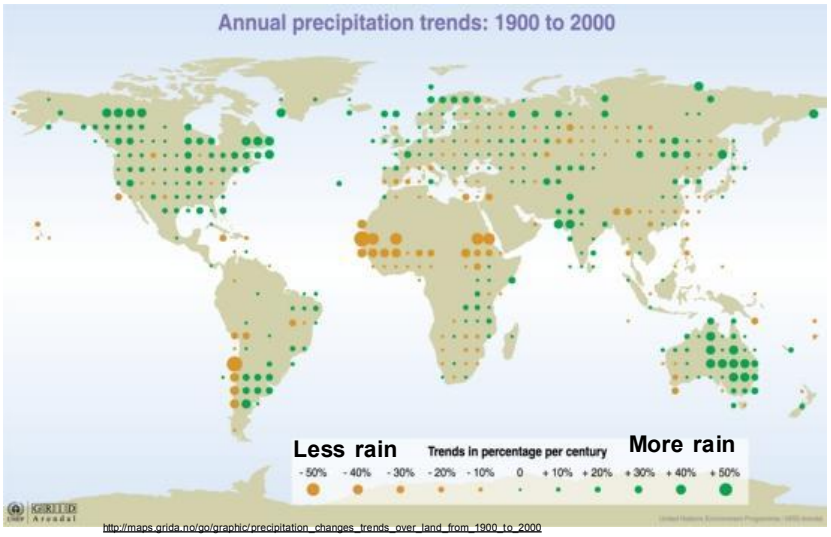


Observed temperatures

Model predictions (including natural and human drivers)

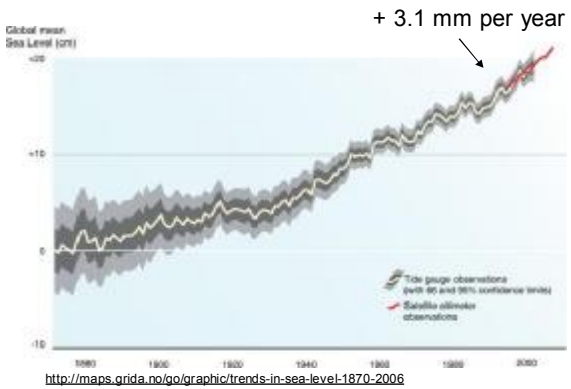
Model predictions (including only natural drivers)

Changes in precipitation patterns



http://maps.grida.no/go/graphic/precipitation_changes_trends_over_land_from_1900_to_2000

Rising sea levels



http://maps.grida.no/go/graphic/trends-in-sea-level-1870-2006

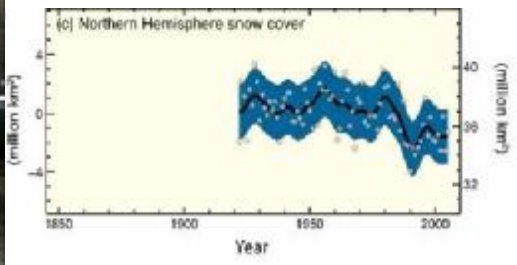
Global mean sea level rise from 1870 - 2006

- Sea levels are rising due to thermal expansion and melting glaciers and ice caps
- Average global sea levels have risen 17 cm during 20th century and may rise 28-58 cm by 2100

More extreme weather events

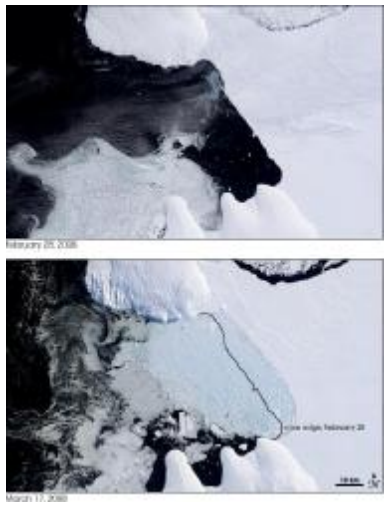
Decreasing snow cover and melting glaciers

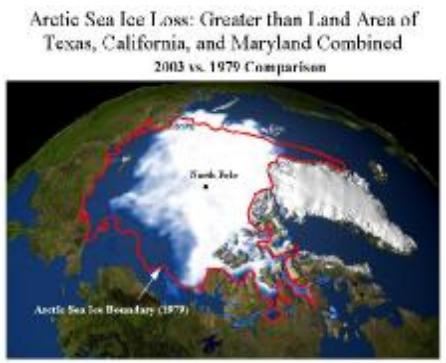
Decreasing snow cover



http://www.mounteverest.net/news.php?id=1361

Warming of poles and loss of sea ice



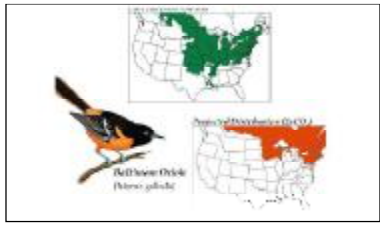


Collapse of Wilkins Ice Shelf, Antarctica

http://earthobservatory.nasa.gov/Study/WilkinsIceSheet/

Changes in ecosystems

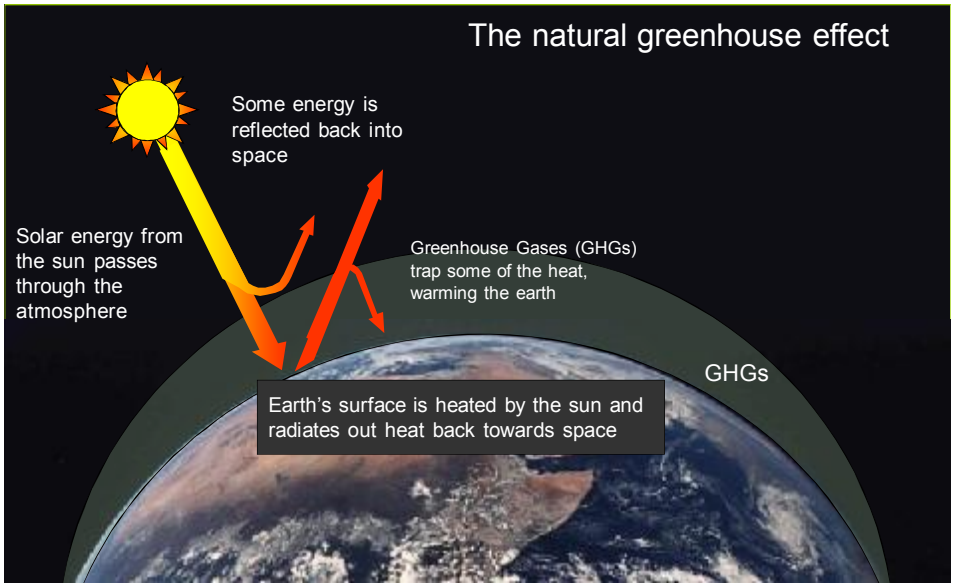
- Earlier timing of spring events
- Poleward and upward shifts in plant and animal communities
- Loss of polar and montane habitats



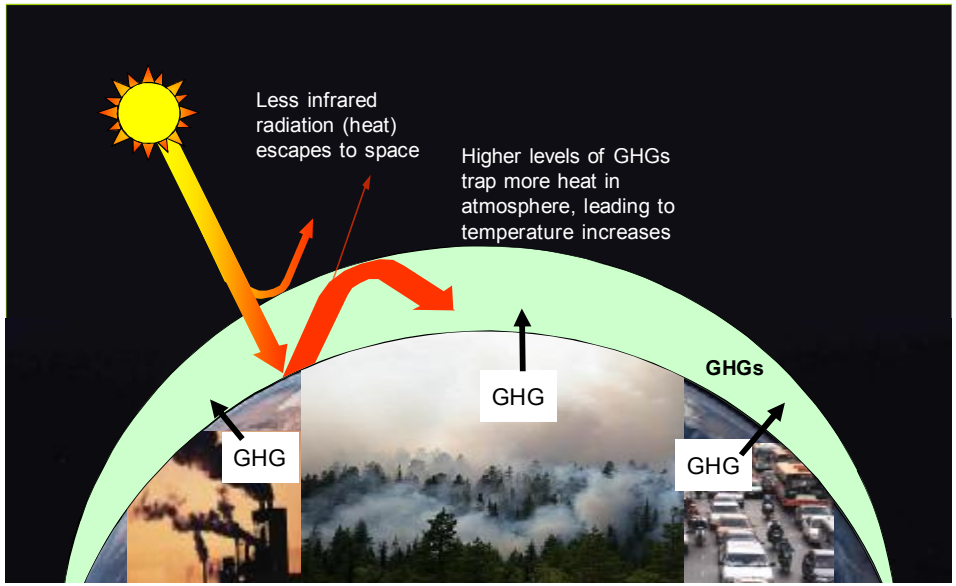
Part 2:

What causes climate change and where are greenhouse gas emissions occurring?

What is causing climate change?



The enhanced greenhouse effect



What human activities generate GHGs?

Greenhouse Gas	Industrial Sources	Land Use Sources
Carbon dioxide (CO_2)	fossil fuel combustion and cement manufacturing	Deforestation and burning of forests
Methane (CH_4)	Landfills, coal mining, natural gas production	Conversion of wetlands Rice paddies Livestock production
Nitrous oxide (N_2O)	Fossil fuel combustion Nitric acid production	Fertilizer use Burning of biomass
Hydrofluorocarbons (HFCs)	Industrial processes Manufacturing	---
Perfluorocarbons (PFCs)	Industrial processes Manufacturing	---
Sulphur hexafluoride (SF_6)	Electrical transmission and distribution systems	----

What is the relative impact of different GHG's?

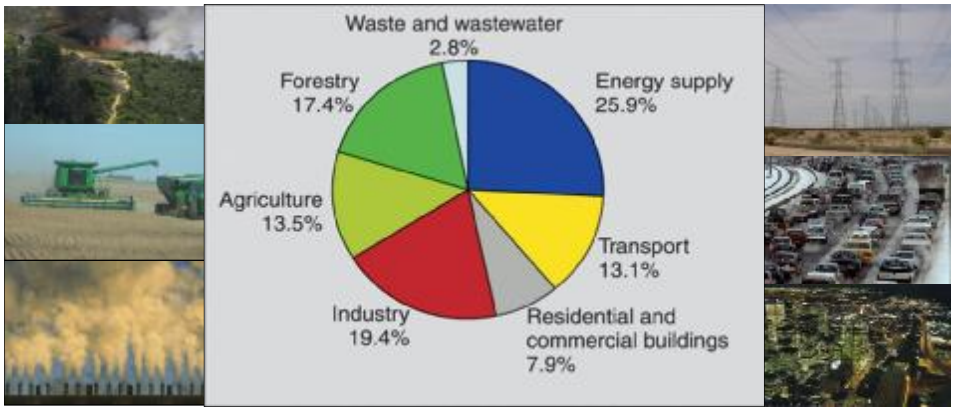
-Depends on how long they stay in the atmosphere and how good they are at absorbing infrared heat

Greenhouse Gas	Atmospheric Lifetime (yrs)	Global warming potential (CO_2 equivalent)
Carbon dioxide (CO_2)	Variable (5-2000)	(1)
Methane (CH_4)	12	23
Nitrous oxide (N_2O)	114	296
Hydrofluorocarbons (HFCs)	260	120 – 12,000
Perfluorocarbons (PFCs)	10,000 (C_2F_6)	5,700 – 11,900
Sulphur hexafluoride	3,200	22,200

This means that:

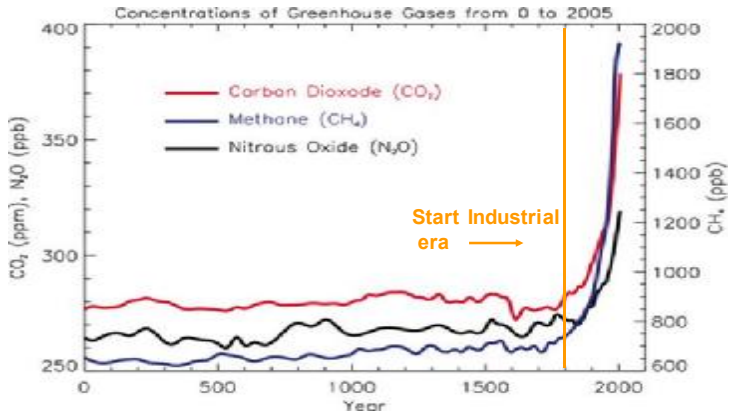
- 1 t CH_4 has the equivalent effect of 23 tons of CO_2
- 1 t N_2O has the equivalent effect of 296 tons of CO_2

Which sectors produce greenhouse gases?



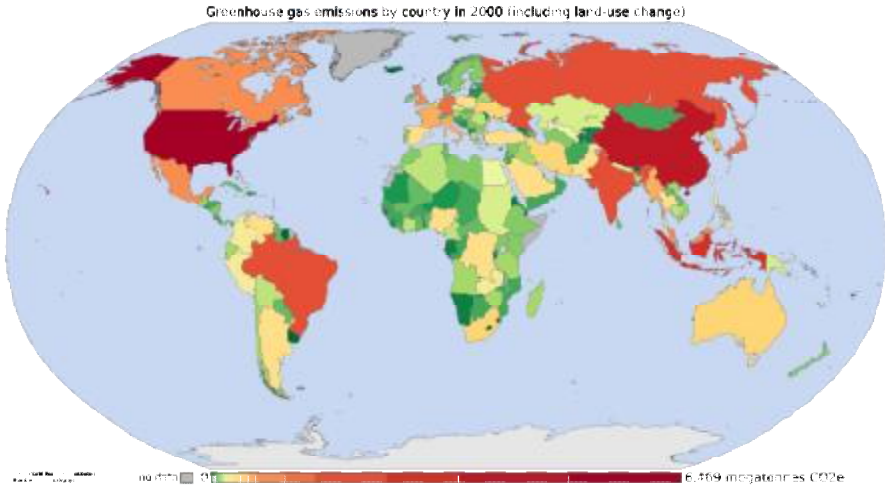
Source:

How rapidly are GHG concentrations rising?



- CO_2 levels are the highest in last 650,000 years
- In the last 50 yrs, CO_2 levels have grown more rapidly than ever before
- CO_2 levels are increasing 1.5- 2 ppm/yr

Where are greenhouse gases being emitted?



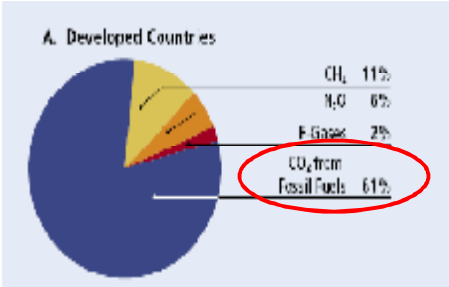
Low emissions

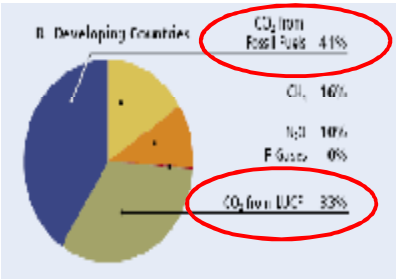
High emissions

Source: World Resources Institute's CAIT 4.0 database

Sources of emissions

The sources of emissions differ across developing versus developed countries





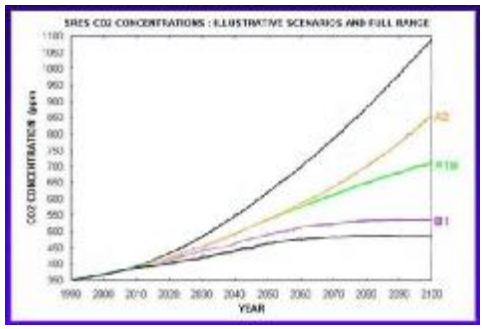
Greatest source of GHG = fossil fuels

Land use change (deforestation) is a major source (second only to fossil fuels)

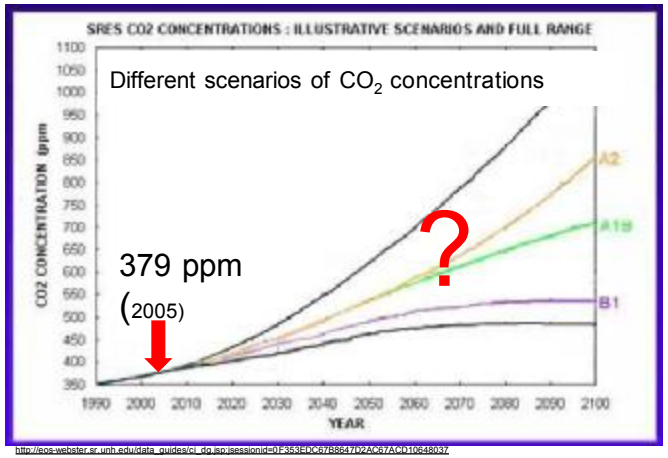
Source: World Resource Institute (Navigating the numbers)

Part 3:

What are the projections for the future?



How high will CO_2 levels go?

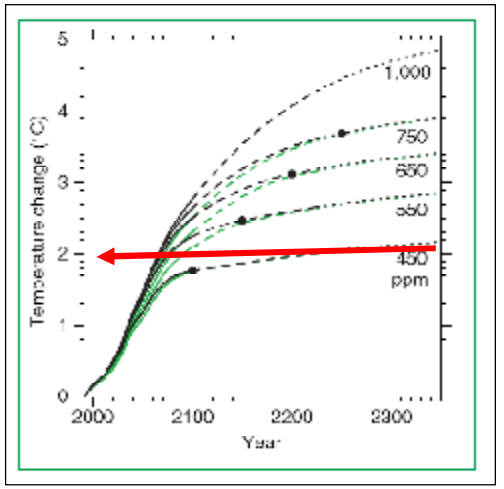


1100 ppm?

450 ppm?

Wide range of possible CO_2 concentrations, depending on how quickly and significantly emissions are reduced

How much will temperatures rise?



- Global temperatures will be determined by atmospheric GHG concentrations
- Many groups are advocating a target of 450 ppm to prevent temperature changes of more than 2 °C

Adapted from: IPCC Fourth Assessment Report (2007), Working Group 3

Future projections due to climate change

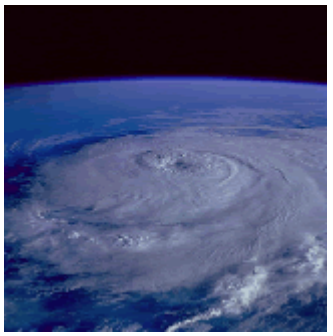
By 2100:

- CO_2 levels could reach 600 to 1550 ppm
- Mean surface temperatures could increase from 1.8 C to 4.0 ° C
- Mean sea level is expected to rise 0.18 to 0.60 m

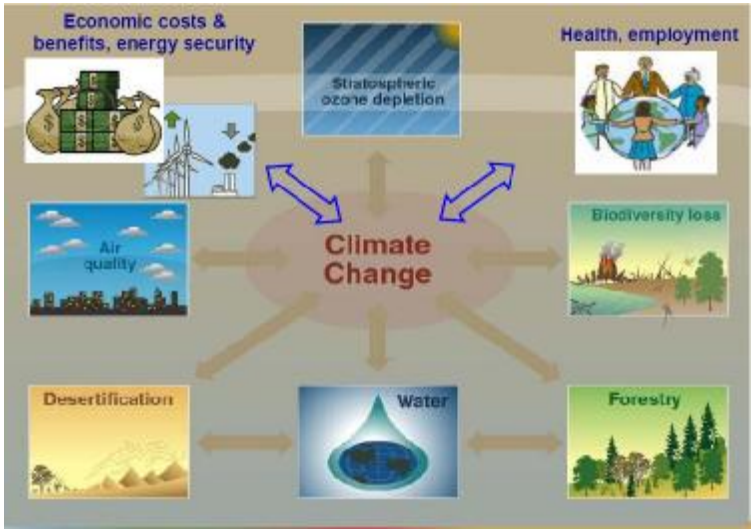
Source: IPCC,2007

Part 4:

What are the impacts of climate change?



Climate change is likely to change all aspects of human life



Impacts of climate change

Impacts on human communities and livelihoods

Impacts on water supplies

Impacts on agriculture

Impacts on ecosystems and species

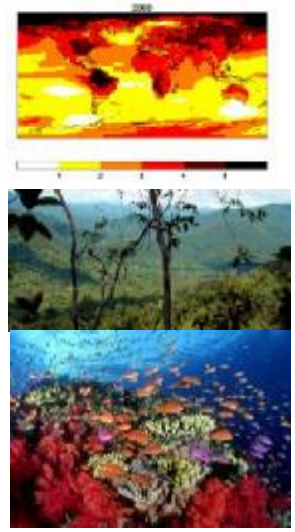
"Approximately **20-30% of plant and animal species** assessed so far are likely to be at increased risk of extinction if increases in global average temperature exceed 1.5-2.5° C." (IPCC, 2007)

How does climate change impact biodiversity?

Physical changes in terrestrial and marine ecosystems

Changes in :

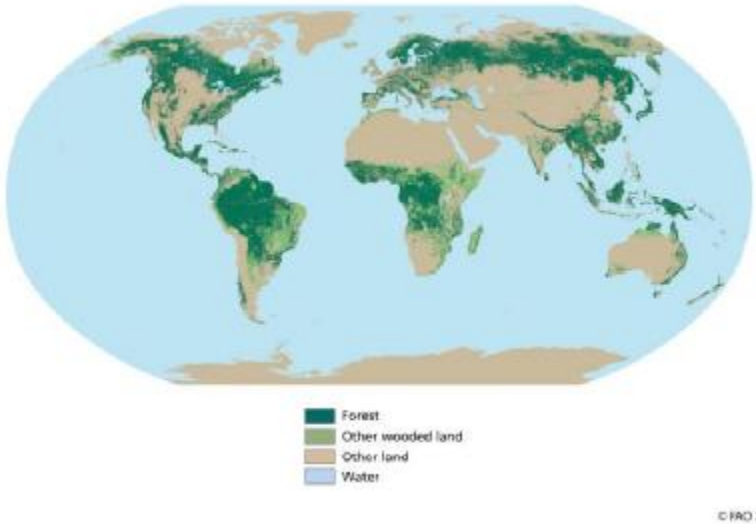
- Distribution of suitable microclimates
- Appearance of novel microclimates and disappearance of certain microclimates
- Timing, availability and distribution of food resources
- Habitat distribution
- Loss of certain habitat types (i.e polar regions, montane areas)



Part 5:

Forests in the global carbon cycle

The World's Forests

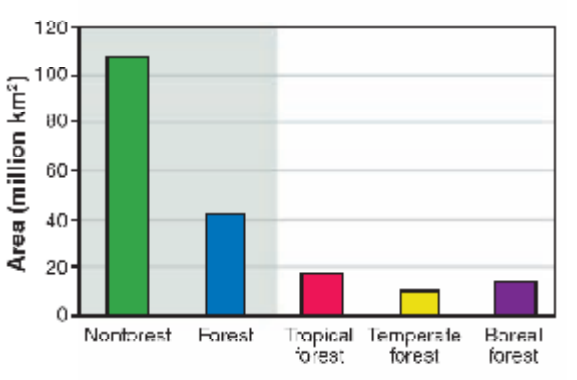


Extent of forests globally

30% of earth's land surface is forest (4 billion hectares)

Forest area by biome

Area forest cover



Tropical	16~17 M km2
Temperate	9~10 M km2
Boreal	15~16 M km2

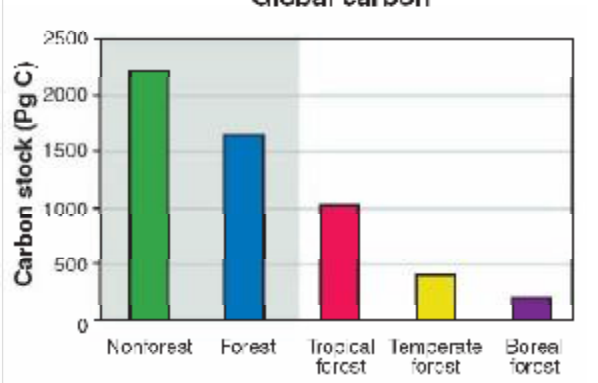
Source: G. B. Bonan Science 320, 1444 -1449 (2008)

Forest carbon globally

45% of terrestrial carbon is stored in earth's forests

Carbon stock by biome

% terrestrial C

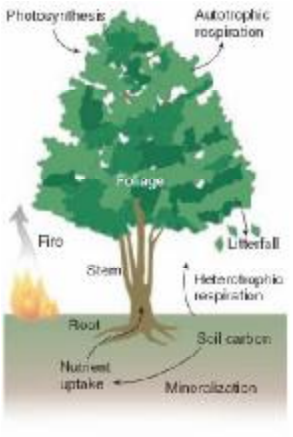


Tropical	~25%
Temperate	~10%
Boreal	~5%

- Forests absorb 2.6 gigatons C (9.5 gT CO2) per year
- Emissions from tropical deforestation 1.5 gigatons C per year

Source: G. B. Bonan Science 320, 1444 -1449 (2008)

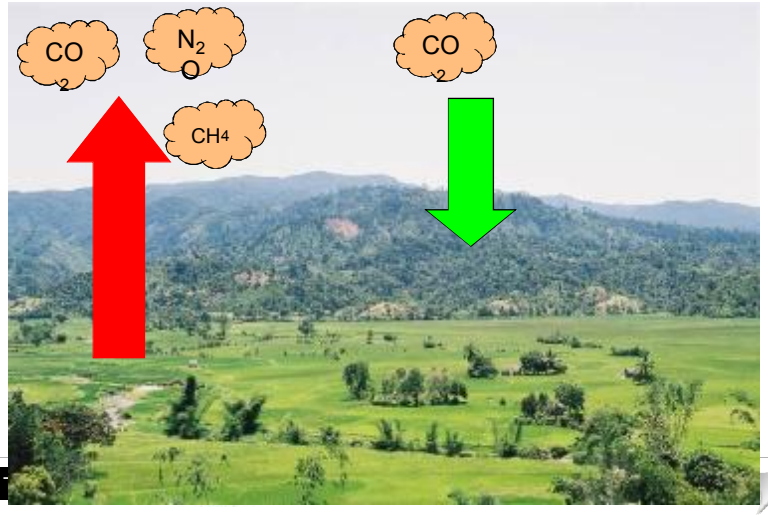
Forests: our planet's lungs



- Forests play an indispensible role through photosynthesis, absorbing CO2 and respiring O2
- CO2 is converted to Carbon, the building block of life present in all organic forms
- Forests store carbon in woody material and soils – more than twice the amount of carbon in the atmosphere
- Carbon is cycled through the plants, water, and soil in a forest
- Decomposition and death of trees and plants releases carbon back to the atmosphere

Source: G. B. Bonan Science 320, 1444 -1449 (2008)

The land use sector can serve as both a source of GHG emissions, as well as a sink



Human Intervention

Emissions (GtC yr^{-1}) due to changes in land use (IPCC 2007)

	Tropical American	Tropical Africa	Tropical Asia	Pan-Tropical	Non-tropics	Total Globe
AR4	0.7 (0.4 to 0.9)	0.3 (0.2 to 0.4)	0.6 (0.4 to 1.1)	1.6 (1.0 to 2.2)	−0.02 (−0.5 to +0.5)	1.6 (0.5 to 2.7)

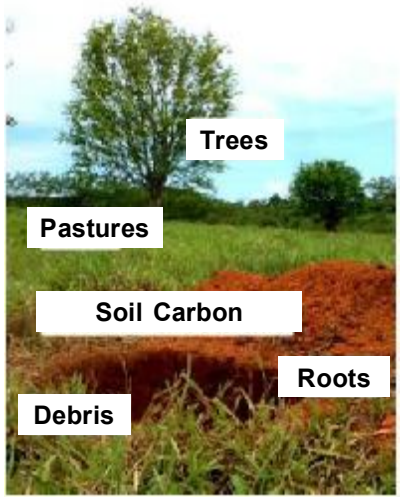
Human activities causing CO2 emission

Part 6:

Climate change mitigation through forestry

Measuring Forest Carbon

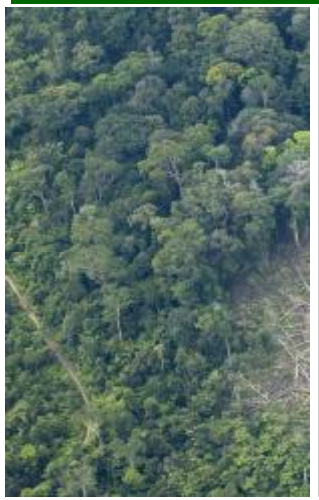
- The carbon measured in forests is primarily in the biomass and vegetation
  - Measured in metric tons
  - Biomass (live or dead, woody or leafy) is 48-52% of forest carbon
  - Calculations usually use 50% biomass as the conversion factor
- Conversions:
  - C is a solid, CO_2 is a gas
  - 1 ton biomass = 1 ton of carbon
  - tCO_2e = tons of CO_2 equivalent
  - tCO_2e are sold, not tC
  - $1tC * 3.67 = 1\ tCO_2e$



Rates of carbon sequestration: Afforestation/Reforestation

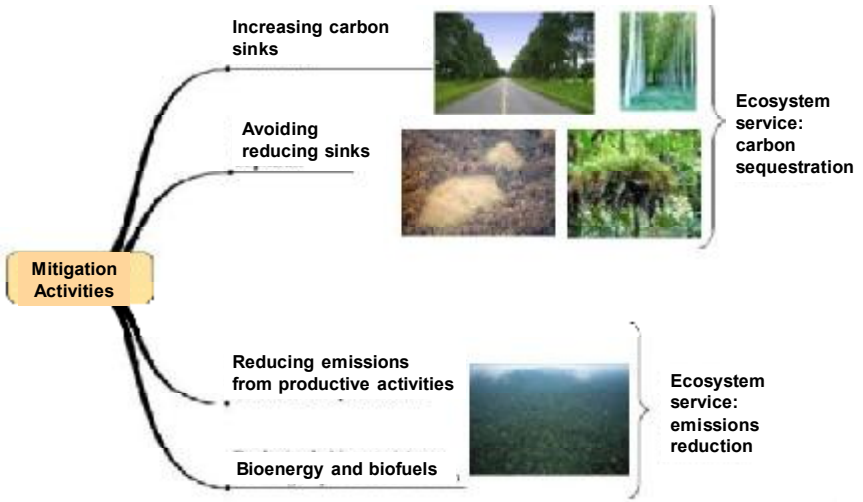
Planted Forest Type	t C/ha/yr Captured	t CO2/ha/yr captured
Boreal – 60 year rotation	½ - 2	**2 - 7**
Temperate – 15 to 60 year rotation	2 – 7	**7 - 26**
Tropics – Eucalyptus, 5 – 16 year old	4 - 14	**15 – 51**
Tropics – Teak, 25 – 75 years old	2 – 4	**7 - 15**
Tropics – Pine, 5 – 30 years old	3 - 12	**11 - 44**

Rates of emissions reductions: Avoided Deforestation



Tropical Forest Type	t C/ha avoided	t CO2/ha avoided
Africa - lowland most forest	155-200	**569 - 734**
Africa - seasonal forest	60-70	**220 - 257**
Africa - dry forest	25-50	**92 - 184**
America - lowland moist forest	90-155	**330 - 569**
America - secondary or logged	63-95	**231 - 350**
Asia - lowland moist forest	95-200	**350 - 734**
Asia - dry forest	22-40	**81 - 147**

Options for mitigating climate change



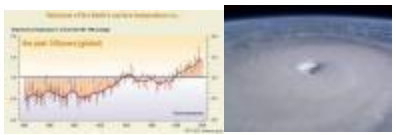
Forests and Climate Change: Mitigation & Adaptation

Remove carbon from the atmosphere, reduce green house gas emissions from deforestation

MITIGATION

Natural forest, forest plantation, agroforestry systems, agricultural systems, etc.

Climate change



ADAPTATION

Reduce climate change impacts and vulnerability

Conclusions

- There are already clear signs of climate change
- These changes impact all regions of the world and almost all aspects of human life
- The rate of climate change and its impacts are projected to increase significantly over the next few decades
- Urgent and immediate action is required both to mitigate the rate of climate change, and to help communities adapt to the ongoing changes

  Deforestation and land use change contributes approx. 20% of global GHG emissions
- Forest conservation, restoration and reforestation can help mitigate climate change by reducing emissions and increasing CO2 uptake (but other mitigation options are also necessary).

REDD

Thank you!

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CCBA · Conservation International · The Nature Conservancy · Rainforest Alliance · WWF for a living planet

Some useful references

- Houghton, John Theodore. ***Global warming: the complete briefing***. 2nd ed. Cambridge U.K.; New York: Cambridge University Press, 1997.
- **Climate Change 2007: The Physical Science Basis**.
  - Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC, 2007): http://www.ipcc.ch/
- Climate Change Science from the UNFCCC
  - Website with information and links: http://unfccc.int/essential_background/background_publications_htmlpdf/items/2625.php
- Climate Change and Biodiversity
  - Book by Thomas Lovejoy and Lee Hannah (2005)
- CICERO - Center for International Climate and Environmental Research
  - http://www.cicero.uio.no/home/index_e.aspx
- Climate Change Science Blog
  - http://www.realclimate.org/

Contributors

- **Contributors to this presentation include:**
  - **Mario Chacon, Conservation International**
  - **Jeff Hayward, Rainforest Alliance**
  - **Olaf Zerbock, Conservation International**
  - **Celia Harvey, Conservation International**

REDD

The Building Blocks of REDD

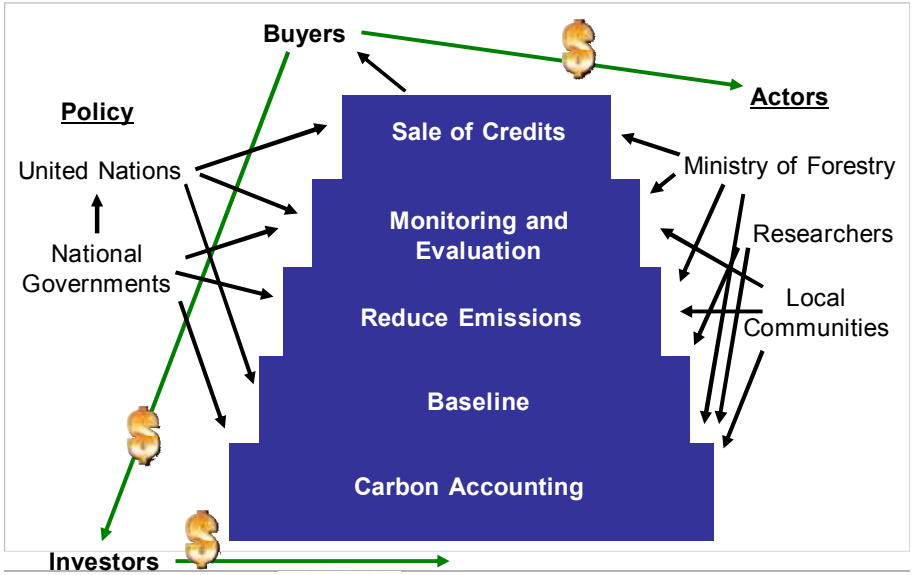
REDD Training Course

Contents

The building blocks of REDD

A general framework for the training

The Building Blocks of REDD



Thank you!

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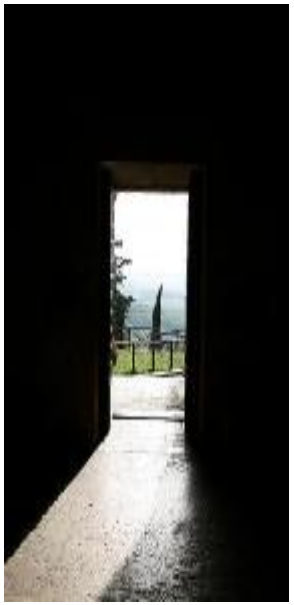


Contributors

- **Contributors to this presentation include:**
  - **Rane Cortez (TNC)**

REDD Policy Context

REDD Training Course

Content

History of international climate change negotiations

The treatment of forests in climate negotiations

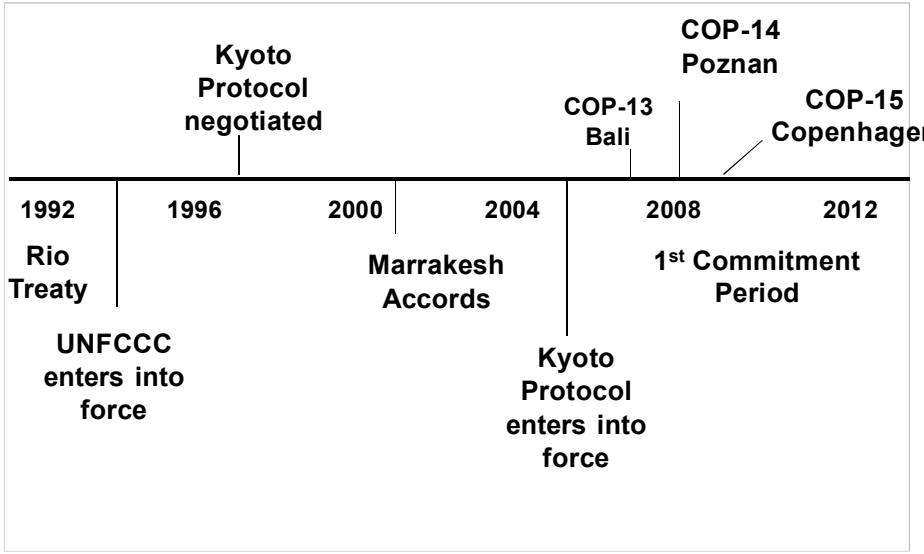
Main policy issues surrounding REDD

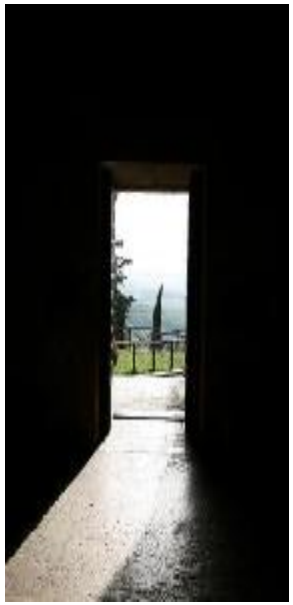
International Climate Negotiations

Activity

- Each group will receive:
  - A timeline
  - Cards with milestones in the climate negotations
  - Cards with the major outcomes of those events
- Each group should work to place the milestones in chronological order and match the key outcomes to each milestone

International Climate Negotiations





Convention Bodies

- COP: Conference of the Parties
- MOP: Meeting of the Parties

- SBSTA: Subsidiary Body on Scientific and Technical Advice
- SBI: Subsidiary Body on Implementation

- AWG-KP: Ad-Hoc Working Group on the Kyoto Protocol
- AWG-LCA: Ad-Hoc Working Group on Long-Term Cooperative Action

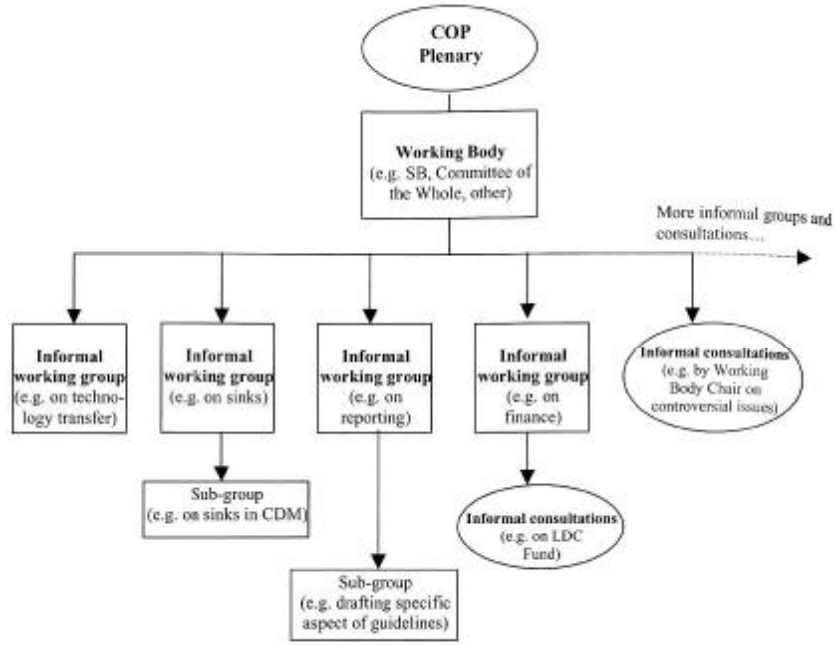
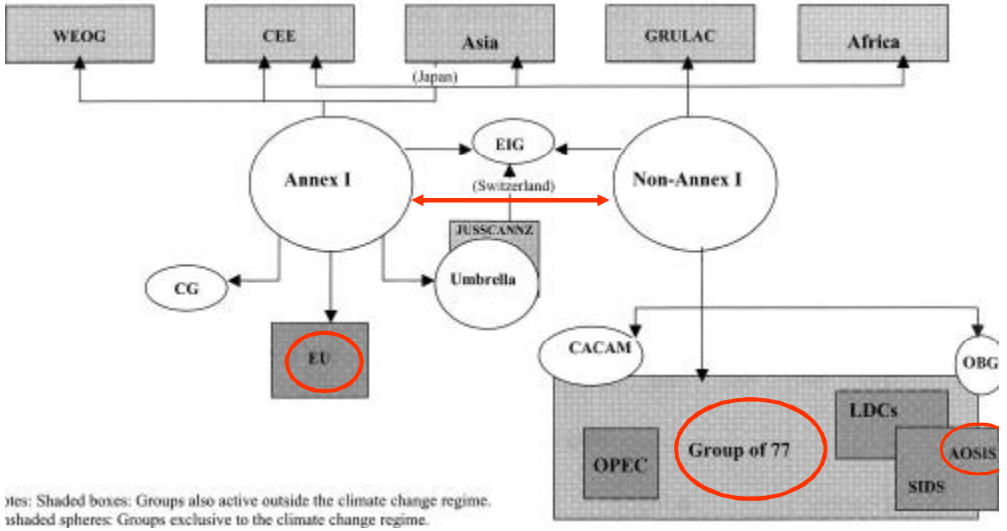


Fig. 14.1 Negotiating forums for a generic COP session

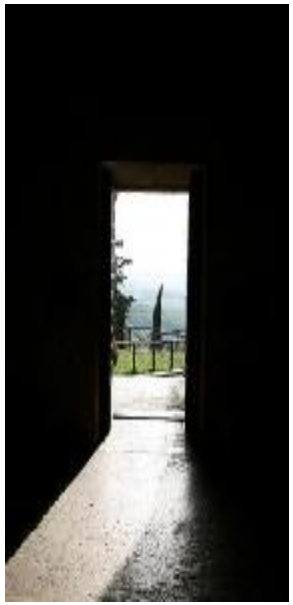


ıtes: Shaded boxes: Groups also active outside the climate change regime.
ıshaded spheres: Groups exclusive to the climate change regime.

EOG: Western European and Others group; CEE: Central and Eastern European group; GRULAC: Group of Latin America and the Caribbean; EIG: ıvironmental Integrity Group; JUSSCANNZ: Japan, US, Switzerland, Canada, Australia, Norway, New Zealand; CACAM: Central Asia, Caucasus, bania and Moldova group; OBG: Open Balkan Group; CG: Central Group; LDCs: Least Developed Countries; SIDS: Small Island Developing States; PEC: Organization of Petroleum Exporting Countries; AOSIS: Alliance of Small Island States. Parties that are members of AOSIS and SIDS correspon nost completely, although the two groups are not identical. Since this figure was drafted, two members of AOSIS – Cyprus and Malta – have joined the EU

Fig. 3.2 Party groupings in the climate change regime

Forests in International Climate Agreements

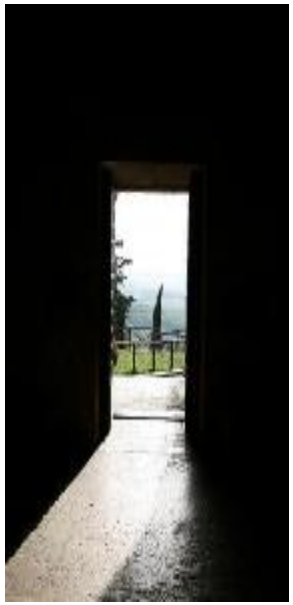


Forests and International Climate Agreements

- The Convention
  - Parties provide national inventories of anthropogenic emissions by sources and removals by sinks of all GHGs, including those from LULUCF
- The Kyoto Protocol
  - Rules for LULUCF negotiated after emissions reductions commitments set – LULUCF emissions reductions were seen as off-setting energy sector reductions
  - In Annex I: LULUCF emissions are under the cap
  - In Non-Annex I: only afforestation and reforestation included in the CDM

REDD in a post-2012 framework

- In 2005, the Coalition for Rainforest Nations proposed including REDD in a post-2012 framework
  - What was different?
    - Improvements in technology
    - Proposed national approach
- At COP-13 REDD was included in the Bali Action Plan



Bali Action Plan

- REDD must be part of a post-2012 agreement
- Data and technical capacity exists to accurately measure and monitor emissions reductions
- Demonstration activities are encouraged
- Requested SBSTA to undertake a program of work on methodological issues

COP-14 in Poland

4. The SBSTA recommended methodological guidance provided in the annex, without prejudice to any future decision of the Conference of the Parties (COP), 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, as reflected in decision 2/CP.13, paragraph 11, which takes into account the methodological issues identified at its twenty-eighth session.

COP-14 in Poland

6. The SBSTA, recalling its conclusions at its twenty-eighth session, requested its Chair, with the support of the secretariat, to organize an expert meeting, subject to the availability of supplementary funding, before its thirtieth session and to prepare a report on this meeting for consideration at that session. This meeting should focus on methodological issues relating:
   a) To reference emission levels for deforestation;
   b) To reference emission levels for forest degradation;
   c) To the role and contribution of conservation, sustainable management of forests, changes in forest cover and associated carbon stocks and greenhouse gas emissions and the enhancement of forest carbon stocks to enhance action on mitigation of climate change and to the consideration of reference levels;
   d) To the relationship among the reference emission levels and relevant reference levels.

COP-14 in Poland

1. The Subsidiary Body for Scientific and Technological Advice noted the importance of the following elements in relation to its programme of work initiated under decision 2/CP.13:
   a) Promoting the readiness of developing countries in relation to decision 2/CP.13, taking into account paragraph 8 of these conclusions;
   b) Further mobilization of resources in relation to decision 2/CP.13, paragraphs 4 and 5 to expand related actions;
   c) Recognizing the need to promote the full and effective participation of indigenous people and local communities, taking into account national circumstances and noting relevant international agreements;
   d) Exploring co-benefits in the context of methodological development related to decision 2/CP.13;
   e) Sharing lessons learned and experiences when applying the guidance referred to in paragraph 2 below and the indicative guidance in the annex to decision 2/CP.13.

2009: Negotiating Schedule

March: Experts meeting on scope and baselines

March 28 - April 8: AWG-LCA and AWG-KP in Bonn

June 1-12: AWG-LCA, AWG-KP, SBSTA, SBI in Bonn

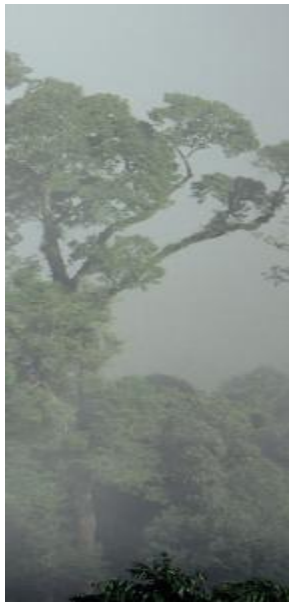
August: ??

September 28 - October 9: AWG-LCA and AWG-KP in Bangkok

October: ??

December 7 – 18: Cop-15 in Copenhagen

Outstanding Policy Issues on REDD

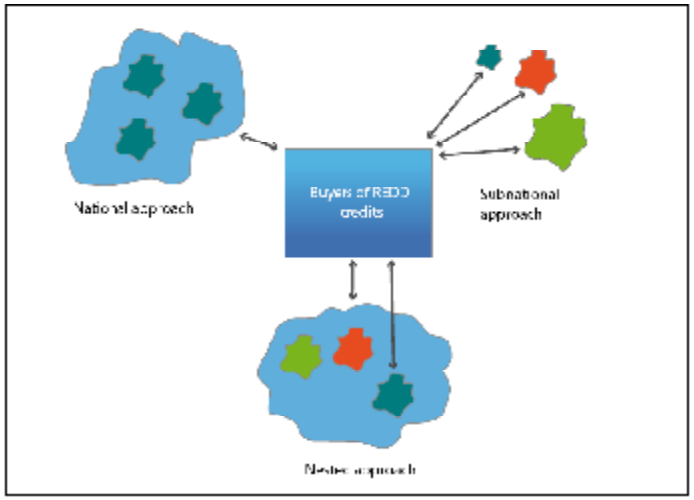


Key Outstanding Policy Issues

- **Scale: National or Sub-national**
- **Funding: Market or Fund**
- **Scope: Include degradation? 'Continued Conservation?' Re-growth?**
- **Social issues**
- **Co-benefits**
- **Baselines**

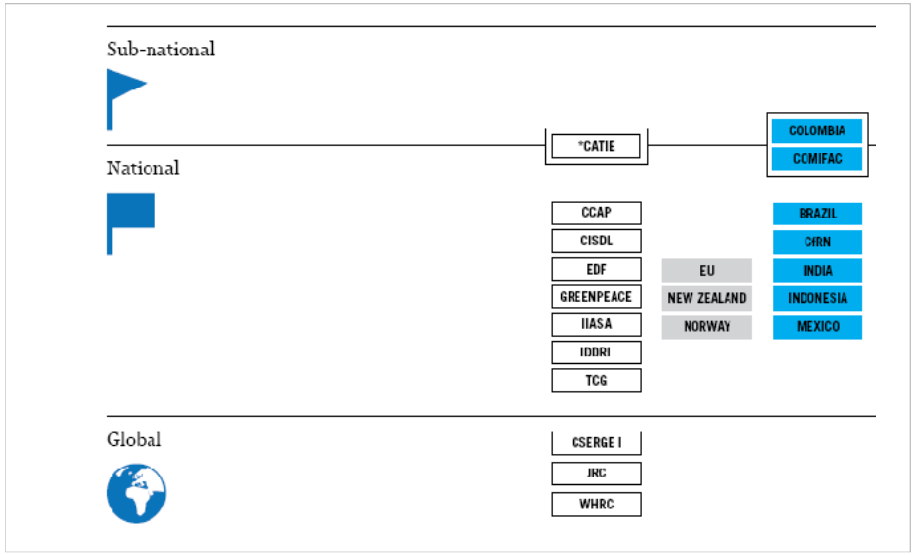
Scale: National, Sub-national, Nested

Source: Angelsen, A., C. Streck, L. Peskett, J. Brown, and C. Luttrell. 2008. *What is the right scale for REDD?* In: Moving Ahead with REDD: Issues, Options and Implications.



Scale

Source: Little REDD Book



Funding: Market or Fund

Market

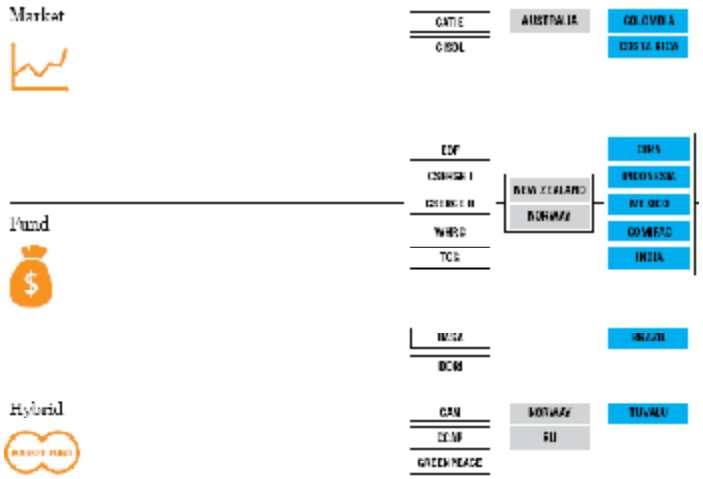
- Credit trading
- Potential to generate large amounts of money
- Concerns:
  - Reduces focus on industrial emissions reductions
  - REDD credits may have adverse impact on carbon markets

Fund

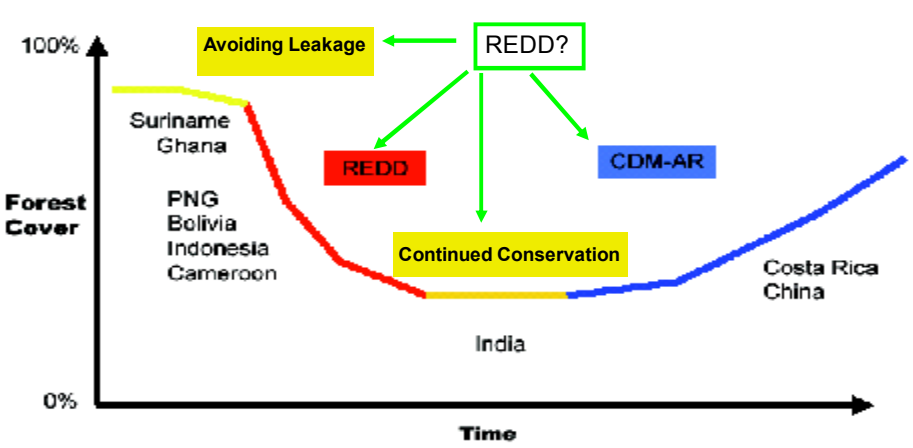
- Created through voluntary donations or some sort of tax or levy linked to the carbon markets
- Emissions reductions are additional
- Concerns:
  - Will it raise sufficient levels of funding?

Financing

Source: Little REDD Book

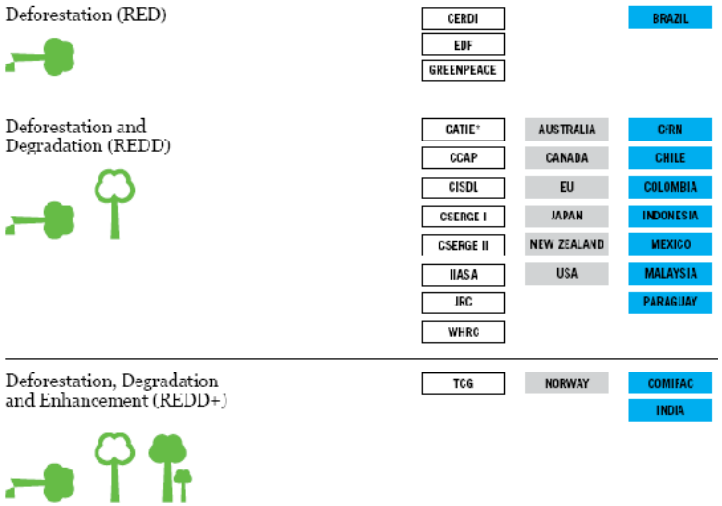


Scope



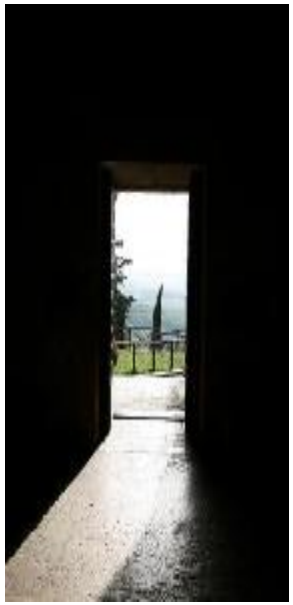
Scope

Source: Little REDD Book



Social Issues

- A REDD agreement will impact Indigenous Peoples and other forest-dependent communities
- How can they participation in the design and implementation of the mechanism?
- How can their rights be ensured?



Co-Benefits

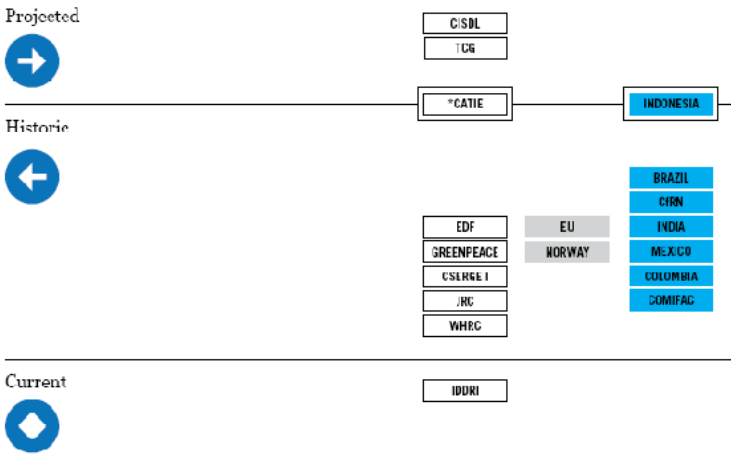
- A REDD agreement will have ecosystem impacts
- A REDD agreement would need to comply with other international agreements
- Does policy need to go beyond that?
- How can these impacts be addressed while still ensuring an efficient mechanism?

Reference Levels

- Based on historic emission rates of modeled projections of the future?
- What historical time period is chosen?
- Are debits accrued?
- Are reference levels recalculated over time?
- How are incentives created for countries with high forest cover but low deforestation rates?

Reference Levels

Source: Little REDD Book



Thank you!

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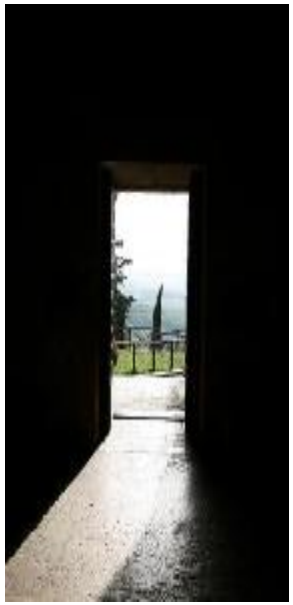


References

- **UNFCCC Essential Background:** http://unfccc.int/essential_background/items/2877.php
- **Moutinho, Paulo. Reducing Emissions by Slowing Deforestation: Compensated Reductions in Brazil**
- **Global Canopy Programme's Little REDD Book**

Contributors

- **Contributors to this presentation include:**
  - **Rane Cortez (TNC)**
  - **Steve Ruddell (WWF)**

REDD
Technical Elements

REDD Training Course

Contents

Additionality and baseline

Leakage and non-permanence

Measurement and monitoring

Other Aspects

Part 1:

Additionality & Baseline

Additionality: Tests

Additionality

reductions that would not have occurred without the project

(1) legal/regulatory - is project legally required?

(2) financial - does project maximize net present value and rate of return without potential carbon payments?

(3) common practice - is project typical for management practices in region or historic on property?

(4) barrier test - can project be implemented without overcoming significant barriers?

Barriers

Investment barriers	=	High up-front costs High political risks Environmental disturbances Difficult legal requirements
Institutional barriers	=	Lack of effective governance/corruption Lack of law enforcement Uncertainty of market or economic incentives
Sociocultural barriers	=	Illegal logging Poorly trained workforce Tenure conflict

Additional to what?

Additional to the baseline.

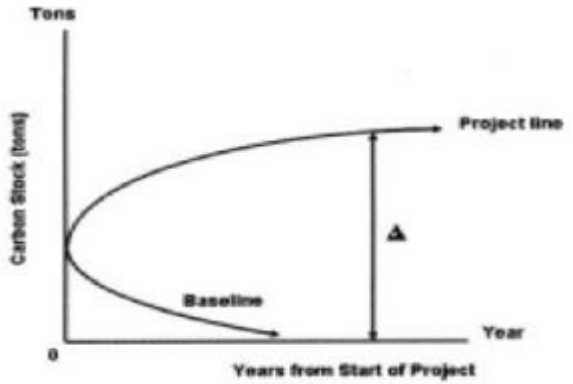
Baseline: what is it?

- Conditions at the start, before the project
- Reference emissions levels
- “Business as usual”
- “Without project”

- Basis to measure project impact
- Carbon credits will be counted as the difference between baseline emissions and emissions reduced by project activities.

Example of baseline for REDD project – avoided deforestation

- Dynamic baseline – changes over time.
- It will <u>decrease</u> without the project, but increases more with the project.



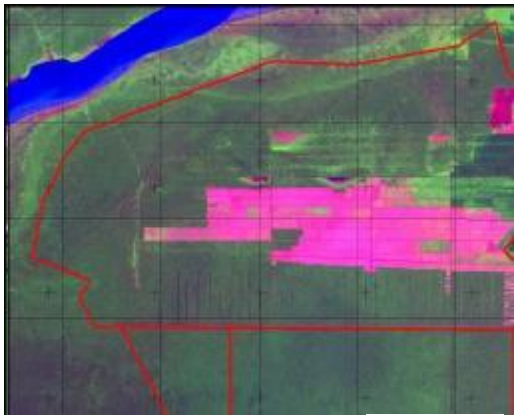
Baseline should describe the prevailing trends of deforestation or degradation.

Baseline: how determined?

- Historic
  - Based on sequence of past images;
  - Based on forest stats (total loss);
  - Based on other stats (population, etc.)
- Modeled
  - Regression analysis from predictive variables
- Negotiated
  - Countries set agreed to levels
- Current carbon stock

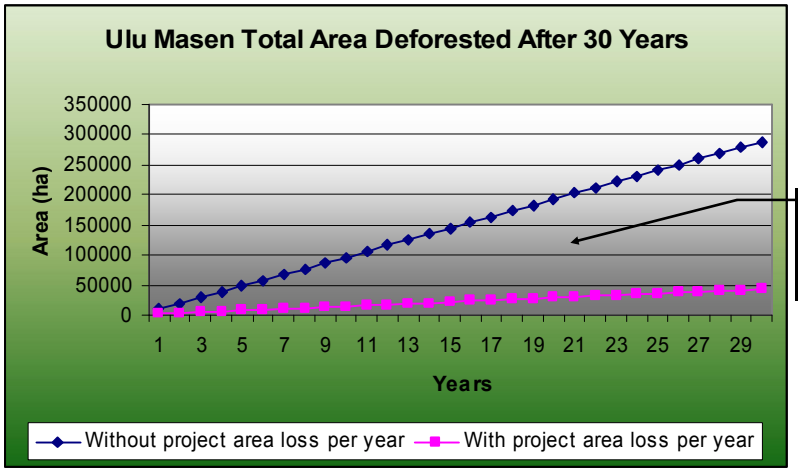
10 year sequence of land use change: natural forest to plantation

Example: Historic Baseline

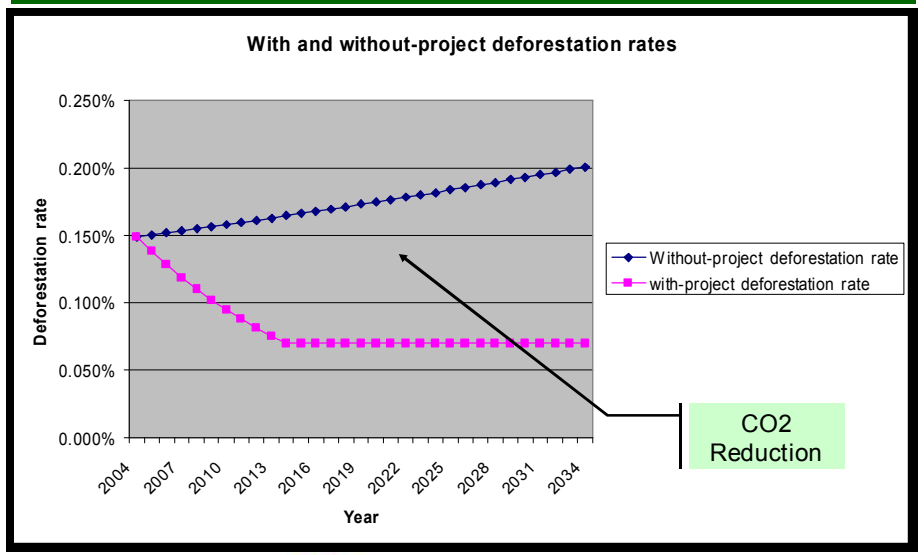


2002

Ulu Masen:
Avoided deforestation scenario



Makira:
Avoided deforestation scenario



History doesn't predict the future

Baseline: Concerns?

- Historic baselines may over-reward countries/actors with poor past performance
- Historic baselines difficult to establish accurately if high-quality imagery limited
- If images were taken over too short of time frame may not be accurate representation
- Projected baselines difficult to establish
- Projected baselines may exaggerate deforestation threats
- The area for inclusion in the baseline may be too narrow

History doesn't predict the future

Baseline: best practice

- Suggested best practices for setting baselines:
  - use five to ten years for more accurate historic information;
  - Re-calculate baseline each five to ten years
  - explicitly choose conservative scenario
  - Indicate statistical error in baseline data;

Baselines and Additionality

Questions?

Part 2:

Leakage & Non-permanence

Exists in other sectors, not just forestry

Leakage: what is it?

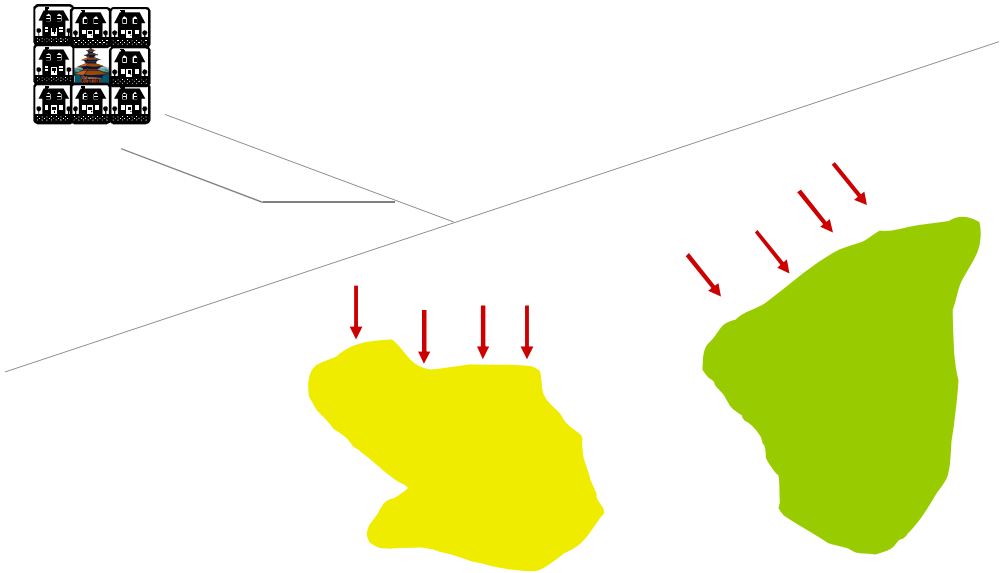
- Human-caused changes in carbon emissions in defined spatial area outside of project boundaries but attributable to project.

Leakage rates:
2 - 38%

(Sohngen & Brown, 2004)

Leakage: what is it?

- Increase in emissions in one area due to a reduction of emissions in another.
- Forest conservation / avoided deforestation: most prone to negative leakage



Also referred to as "Direct Leakage"

Leakage: primary

"activity shifting at local to regional scale due to release of capital and labor through project activities"

- illegal logging moves elsewhere
- palm oil concession issued in neighboring watershed

Also referred to as "In-direct Leakage"

Leakage: secondary

"market effects at regional to global scale due to reduced supply but undiminished demand"

- increased log imports from other country

Case Study: in the region of the Pacific Northwest USA a logging moratorium in 1990s led to 85% decline in timber production off national forest

→ increased volume of Canadian imports

→ Increased plantation production from Southeastern USA

Difficult to accurately quantify amount of leakage

Managing leakage

- Alternative livelihood development
  - *fruit and coffee gardens*
  - *sustainable forestry*
- Portfolio balancing
  - *reforestation*
  - *mangrove restoration*
- Improved governance and spatial planning
- Buffer credits (i.e. 10 – 40%)
- National level accounting

Everything changes, nothing stays the same

(non) Permanence

"Duration and reversibility of a reduction"

- Loss of forest at a later time, after a carbon credit is sold

- What the market desires:
  - Long-term assurance of supply and delivery of carbon credit

Everything changes, nothing stays the same

(non) Permanence: Losses

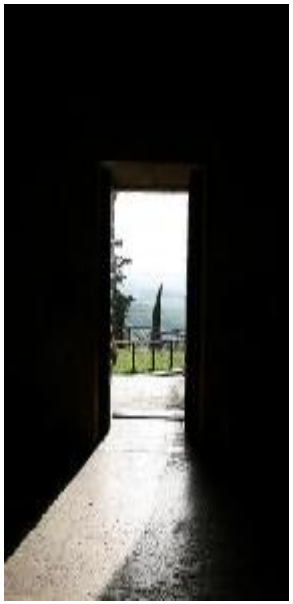
Loss due to human-caused or natural disturbances:

- Pest
- Disease
- Fire
- Wind-throw
- Trespass
- Sale
- Default
- Seizure

Buffers of reserve credits range from 10 – 40%

Managing non-permanence

- Management factors: legal, financial, tenure, staff competency, and protection.
- Buffer reserves of actual carbon storage held in escrow (about 20 – 30%)
- Insurance policies (i.e. for 100 years) to pay for lost carbon
- Contracts with enforceable replacement
- Land trust (covenants)



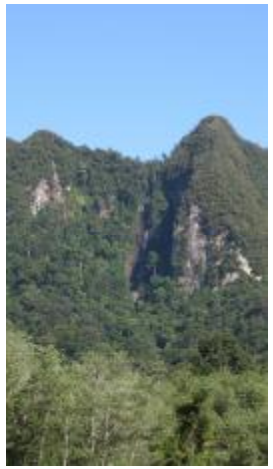
Leakage and Permanence

Questions?

Part 3:

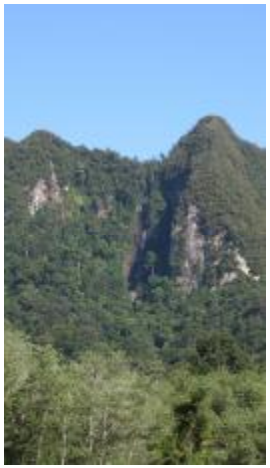
Measurement & Monitoring

Measurement & Monitoring



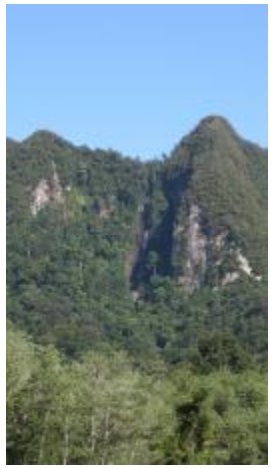
- Methods to measure forest cover change remotely include:
  - Satellites imagery from space
  - Radar
  - Lidar
  - Aerial photographs
- Methods to measure forest cover directly include:
  - Forest inventories
  - Ecosystem or biodiversity surveys
- Measurement of carbon stock changes due to land cover change must combine both forest cover data and carbon content data.

Measurement: IPCC Methodologies



- Good practice for AFOLU, Volume 4 of *IPCC Guidelines for National Greenhouse Inventories 2006*
- Generic methods for measuring biomass, organic matter, and soil carbon
- Methodologies for managed and non-managed lands
- Calculations for CO2 and non-CO2 emissions
- Calculations for forest products
- Methodologies for analyzing land classification categories, land use, and land cover

Measurement: IPCC Methodologies



- Explains steps for preparing national greenhouse gas emissions inventories for AFOLU
- Indicates methods for measuring changes in carbon stock:
  - Forest cover
  - Biomass
- Provides formulas for quantifying changes in carbon stock for all land use classes
- Describes accepted methods for remote sensing
  - Satellite imagery (Landsat, SPOT, MODIS)
  - Radar, Lidar
  - Aerial photographs

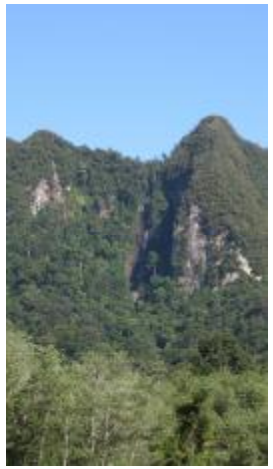
Measurement: IPCC Methodologies

Tier 3
- Higher level of measurement, with forest inventory systems and modelling
- Permanent sample sites and periodic measurement
- High precision disaggregated activity data

Tier 2
- Emission data or carbon stock data at the national or regional level
- National level emissions factors
- More precise spatial data by activity

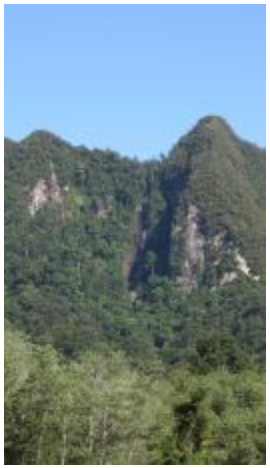
Tier 1
- Predetermined formulas and values (e.g. for emissions factors and changes in stock)
- Data estimates for national level activities (e.g. deforestation rates, forestry statistics, vegetation cover, population changes)

Measurement challenges



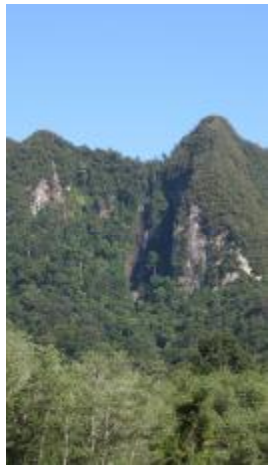
- Capabilities to measure forest biomass at national or regional scales still very limited
- Significant technological advancement in remote sensing capacity needed
- Significant ground truthing of remotely sensed imagery needed
- Carbon stocks of different forest ecosystems worldwide poorly known
- Variable data quality between countries
- Reliance on default values

Monitoring

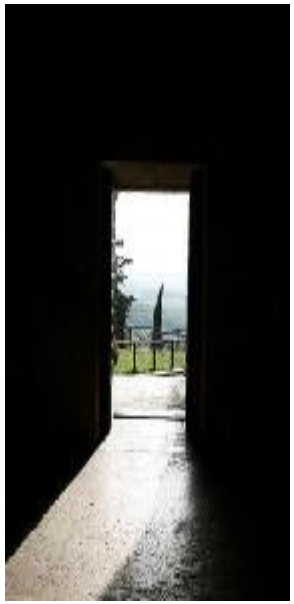


- Monitoring of REDD at national scales will require government approved or managed monitoring programs
- These programs can (or should) be informed by existing carbon verification standards/approaches
- Monitoring at project level will conform to verification standard requirements

Monitoring challenges



- Lack of standardized verification systems
- Internationally mandated systems may threaten national sovereignty
- Monitoring of values beyond forest carbon may overload capacity
- However, not including community impacts may see projects adversely effect indigenous peoples or poor



Measurement and Monitoring

Questions?

Part 4:

Other Aspects

Other Aspects

Governance
- Structural improvements in coordination and implementation for natural resource management
- Improvements en spatial planning and land management
- Improvements for combating corruption and illegal activities

Rights
- Define land tenure
- Rights and ownership of carbon
- Payment distribution systems
- Re-investment systems

Transparency
- Effective consultations
- Full and effective participation

Thank you!

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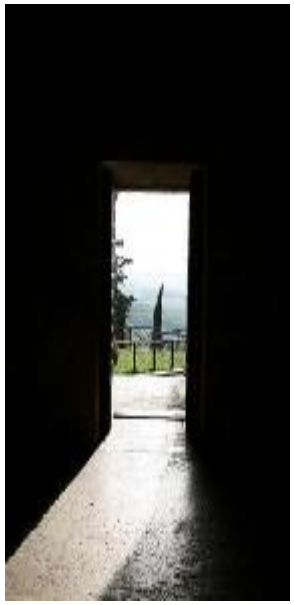


Contributors

- **Contributors to this presentation include:**
  - **Jeffrey Hayward, Rainforest Alliance Manager, Climate Initiative**

Introduction to Carbon Markets

REDD Training Course

Content

Introduction to carbon markets and cap-and-trade systems

Existing carbon markets

Forests in carbon markets

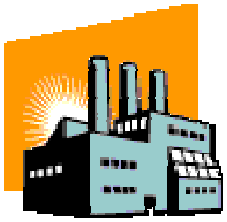
Part 1:

Introduction to carbon markets

Carbon Market Basics

Companies A & B each have a goal of reducing CO_2 emissions by 2,000 tons

Company A



Company B

Carbon Market Basics

It costs Company A $2/ton to reduce its emissions

The market price of a ton of CO_2 = $4/ton

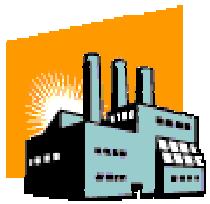
At this price, Company A realizes it can reduce emissions by more than 2,000 tons and sell its extra reductions at a profit

Carbon Market Basics

It costs Company B $6/ton to reduce its emissions

The market price of a ton of CO_2 = $4/ton

At this price, Company B realizes it would be cheaper to buy reductions on the market than to reduce its own emissions



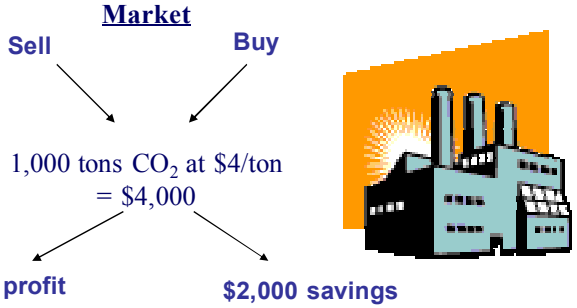
Carbon Market Basics

Company A reduces emissions by 3,000 tons (1,000 tons more than its goal)

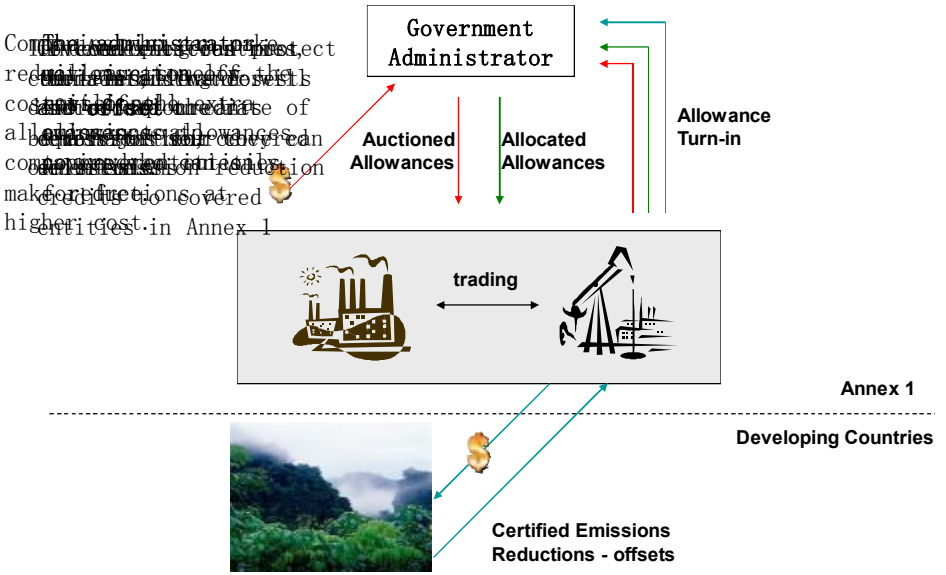
At a cost of $2/ton, 1,000 extra tons cost Company A $2,000

Company B reduces emissions by only 1,000 tons and decides to buy the remaining 1,000 tons needed to meet its goal

At a cost of $6/ton, 1,000 tons cost Company B $6,000



Cap-and-Trade



Part 2:

Existing carbon markets

Existing carbon markets: voluntary and compliance

Transaction Volumes and Values, 2006 and 2007[i]

Markets	Volume ($MtCO_2e$)		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
Total Voluntary Markets	**24.6**	**65.0**	**96.7**	**330.8**
EU ETS	1,1044	2,061	24,436	50,097
Primary CDM	537	551	6,887	6,887
Secondary CDM	25	240	8,384	8,384
Joint Implementation	16	41	141	495
New South Wales	20	25	225	224
Total Regulated Markets	**1,702**	**2,918**	**40,072**	**66,087**
Total Global Market	**1,727**	**2,983**	**40,169**	**66,417**

Source: Ecosystem Marketplace, New Carbon Finance, World Bank

Where are these markets and how are credits bought and sold?

- **Over-the-Counter (OTC)**
  - Brokers or direct emitters can buy credits from brokers or project owner. Registries will issue certificates for credits.
  - Buyers are driven by voluntary carbon neutral goals.
- **Emissions Trading (ETS, CCX)**
  - To sell, access trading platforms as a member or through aggregators who trade on behalf of the project owner.
  - Registries will retire these credits and ensure no double counting.
  - Buyers are driven by emission reduction compliance requirements.

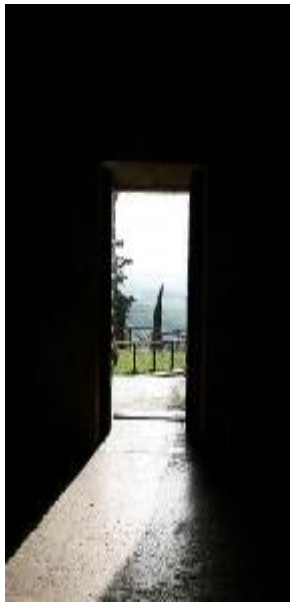
Demand and prices for CO_2 : emissions trading and OTC markets

- **Over-the-Counter (OTC)**
  - Demand and prices are determined by offset project quality characteristics that include project design elements for social and biodiversity co-benefits.
  - Buyers are not driven by compliance requirements

- **Emissions Trading (ETS, CCX)**
  - Demand and prices are established by the ETS and CCX rules and the demand for a fungible commodity
    - quality characteristics are already built into the rules and are not distinguished from other offset projects
    - fungible commodity – "a ton is a ton"
  - Buyer are driven by emission reduction compliance requirements

Part 3:

Forests in carbon markets

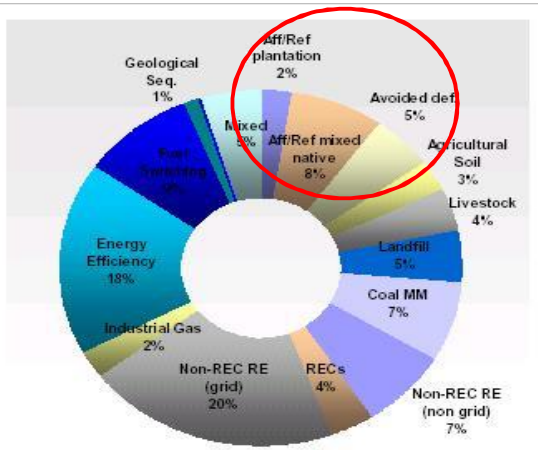


Forests in the CDM

- **Includes afforestation and reforestation projects**
  - **Only three registered forestry project to date**
  - **Forestry projects generate tCERs**

- **Projects that reduce emissions from deforestation and degradation in developing countries are not included**
  - **Concerns about measurement and monitoring, leakage, permanence, and additionality**

Forests in the voluntary markets



Total = 15%

9.75 MtCO2e

$49.6 million

Source: Ecosystem Marketplace, New Carbon Finance

Forest offset prices: voluntary vs. compliance markets

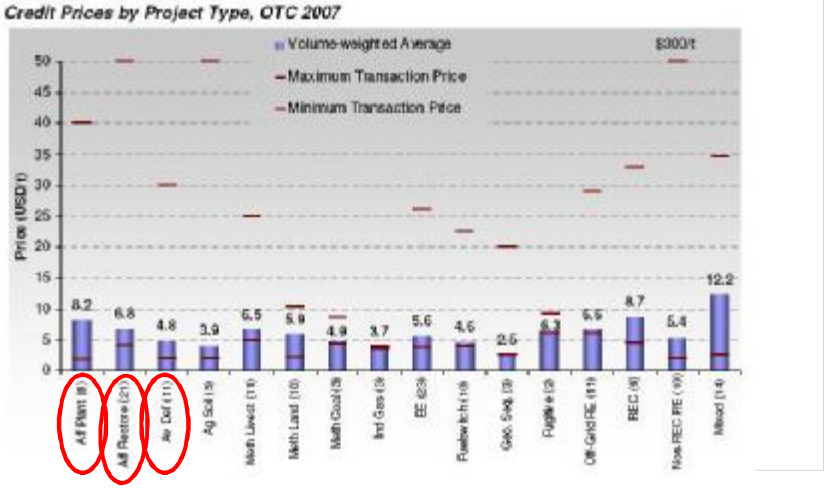
Voluntary Market

- OTC Prices for Forestry Offsets
  - ~ $4 - $8 per tCO2e (Ecosystem Marketplace, July 2008)
- CCX Prices for Offsets
  - ~ $4 per tCO2e in July 2008 (CCX)

Compliance (Kyoto) Market

- EU ETS Prices for Offsets
  - ~ $40 per tCO2e in July 2008 (Point Carbon)

OTC credit prices by project type: 2007



What is traded and how is it calculated ?

- **The universal metric for trading is a metric ton of CO_2 equivalent (Mt CO_2 e)**
- **Conversion factors:**
  - 1 metric ton of dry wood = .5 metric tons of carbon (C)
  - 1 metric ton of C = 3.6667 t CO_2
  - 1 dry metric ton of wood = 1.83335 t CO_2 e
  - t CO_2 e = # dry metric tons of wood x .5 x 3.6667

Thank you!

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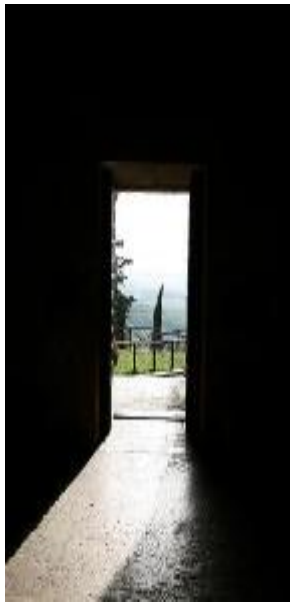

Contributors

- **Contributors to this presentation include:**
  - **Steve Ruddell (WWF)**
  - **Rane Cortez (TNC)**
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The Scale of REDD:
National, Sub-national, and Project

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Contents

Defining the terms

Advantages and challenges associated with various approaches

Hybrid approaches

Background on the Debate

- **Should incentives flow directly to national governments or to sub-national level implementers?**
- **The terms of the debate are often not clearly stated**
- **National approaches ease historical concerns about project-level approaches yet are extremely complex**
- **There are pros and cons of each approach**

What are we talking about?

- Accounting
- Implementation
- Ownership

Carbon Accounting
Pros and Cons of Each Level

- National-level
  - Accounts for in-country leakage
  - Monitoring emissions reductions at the national level is more efficient
  - Some countries do not currently have the capacity to create national accounting frameworks
- Sub-national/Projects
  - Less complexity
  - Models exist
  - Each project needs to account for leakage
  - Each project needs its own monitoring system

Implementation
Pros and Cons of Each Level

- National-level
  - Motivates the national government to undertake necessary reforms
  - Gets to the needed scale
  - Very complex – could result in a large bureacracy
  - Difficult to focus on local drivers of deforestation
- Sub-national/Projects
  - Less complexity – models exist
  - Can better identify and target local drivers of deforestation
  - Fosters greater local participation

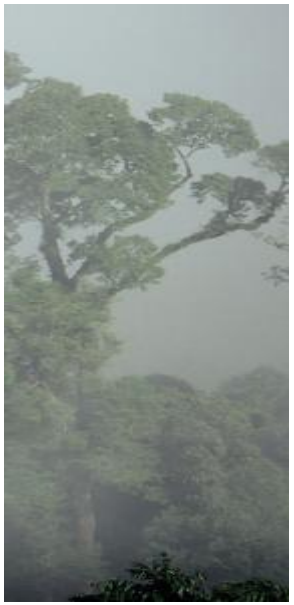
Ownership
Pros and Cons of Each Level

- National-level
  - Motivates the national government to undertake necessary reforms
  - Overall compensation is based on performance against a national baseline
  - Could result in less private investment
  - Less transparency in revenue distribution
- Sub-national/Projects
  - More attractive to private investors
  - More transparent

A Spectrum of Options

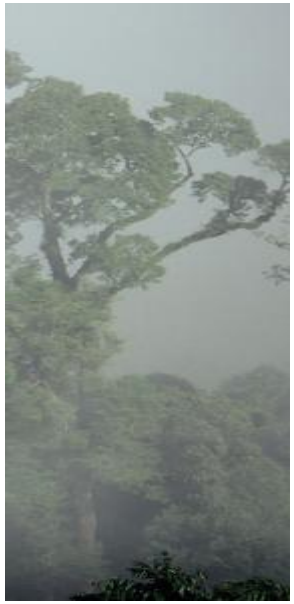
- **Strictly project-level**
- **National accounting with project implementation**
- **National accounting with both project and national implementation**
- **Strictly national-level**

	Strictly Projects	National Accounting w/project implementation	National Accounting w/project & national implementation	National Implementation
Accounting	Project level	National & project	National & Project	National
Implementation	Projects	Projects	National & project	National
Ownership of Reductions	Project owner	Projects (nations could receive a %)	Projects and Governments	National Government
Approval/ Verification	National/ 3rd party	National/ 3rd party	National/ 3rd party	National/ 3rd party



Creating Linkages

- **Risk-sharing agreements**
- **Profit-sharing agreements**
- **Complementary policies**

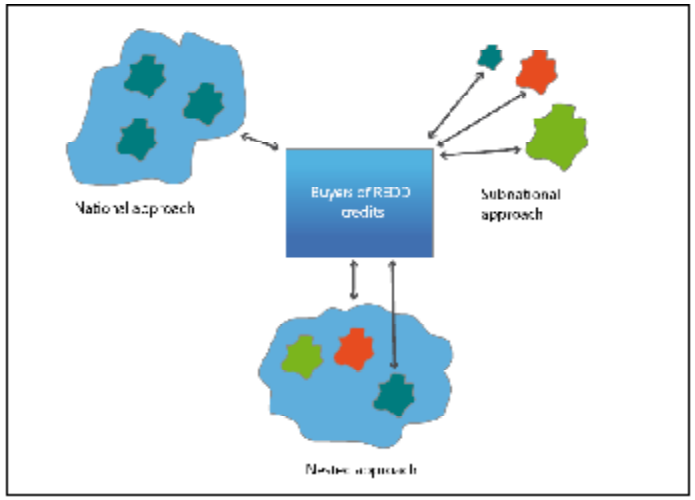


The Nested Approach

- **Countries that can, should take a national approach to baseline setting and carbon accounting**
- **Other countries begin with a sub-national approach**
- **Once the total area of the participating country reaches an agreed threshold, or an agreed upon number of years have passed, countries would be required to take on a national approach**
- **Incentives would be created to spur countries to move to a national approach as soon as possible**

The Nested Approach

Source: Angelsen, A., C. Streck, L. Peskett, J. Brown, and C. Luttrell. 2008. *What is the right scale for REDD?* In: Moving Ahead with REDD: Issues, Options and Implications.



Indonesia Example

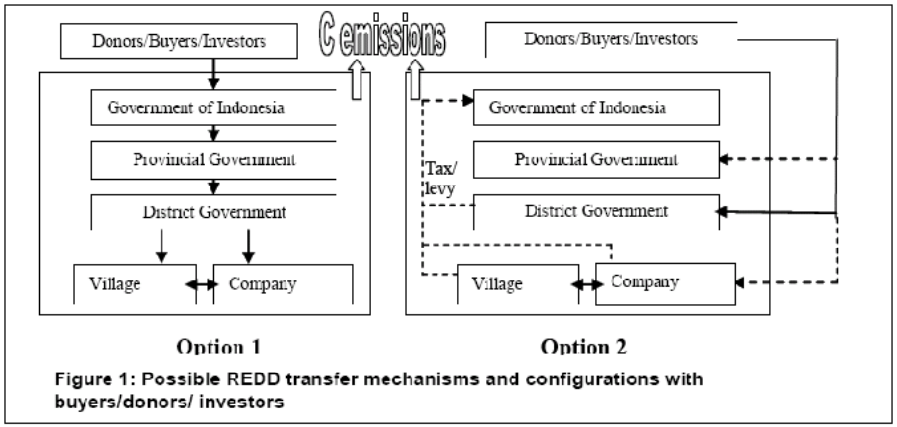


Figure 1: Possible REDD transfer mechanisms and configurations with buyers/donors/ investors

REDD

Thank you!

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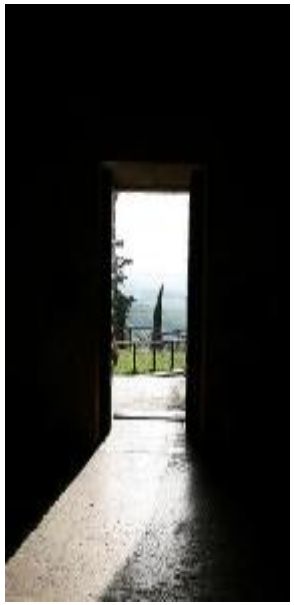
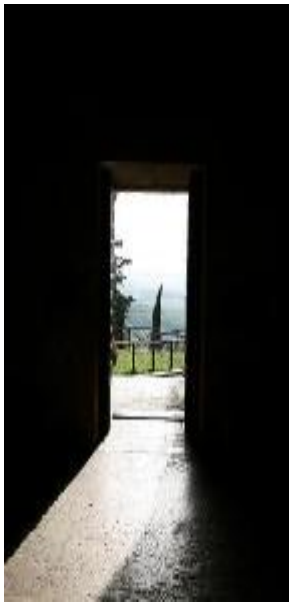


References

- Pedroni, Streck, and Porrua, 2007. Creating Incentives for Avoiding Further Deforestation: The Nested Approach
- Angelsen, A., C. Streck, L. Peskett, J. Brown, and C. Luttrell. 2008. *What is the right scale for REDD?* In: Moving Ahead with REDD: Issues, Options and Implications



Contributors

- **Contributors to this presentation include:**
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National-Level REDD Programs

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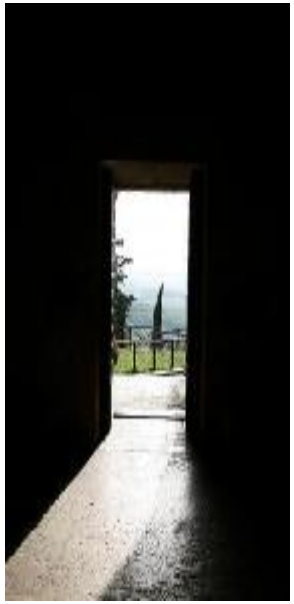
Content

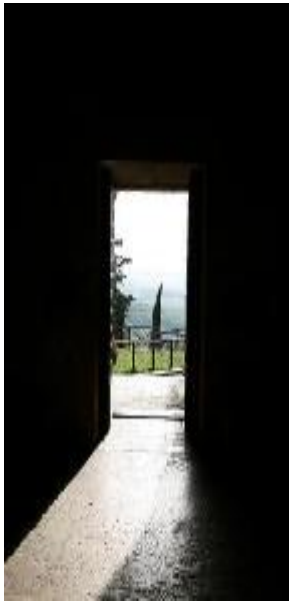
Principle elements of a national-level REDD program

Guidelines for national level REDD programs



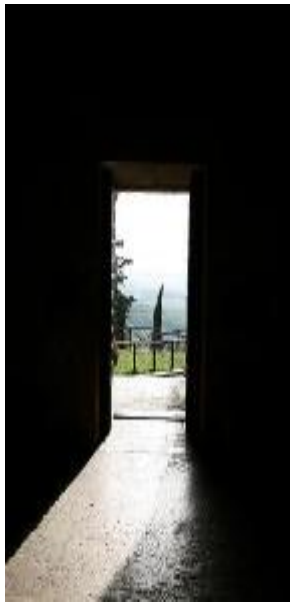
Incorporating International Agreements and National Regulations

- **International agreements (COP-13 decision) provide indicative guidance for demonstration activities**
- **Bilateral and multilateral programs also provide guidelines**
- **Relevant national regulations and development objectives need to be considered**



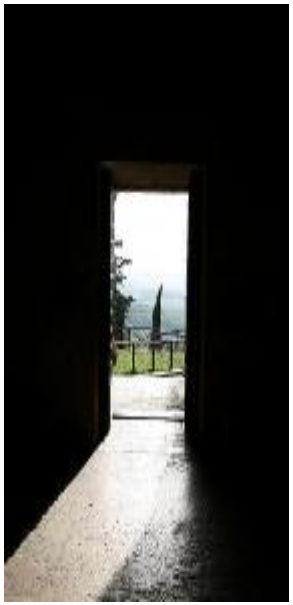
Elements of a National-Level REDD Framework

- **National baseline/Reference Emission Level (REL)**
- **Credits allocated to the national government based on performance against a national reference emission level/baseline**
- **Monitoring system**
- **Country-wide accounting system (carbon registry)**



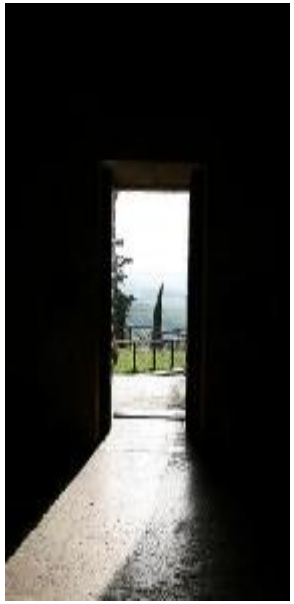
National Level REDD Flexibility/Open questions

- **Level of implementation (national with subnational approaches)**
- **Strategies used (sectoral approach versus area-based approach)**
- **Risk- and profit-sharing agreements (payment distributions, leakage, insurance)**
- **Legal arrangements (national and local regulations, land use plans)**



Forest Carbon Partnership Facility (FCPF)

- **Two funds: Readiness Mechanism ($100M)and Carbon Finance Mechanism ($200M)**
- **The decision to implement REDD programs at the national or sub-national level is the sovereign decision of each country and should take into account various factors (laws and regulations, existing programs, drivers of deforestation, rights, resources, costs, etc)**
- **Sub-national level activities still need to be accounted for at the national level**



Forest Carbon Partnership Facility (FCPF)

- **Baselines: The country would establish a credible reference scenario on REDD, based on methodological guidance from the UNFCCC or other guidance that represents international good practice**
- **Strategies: The country needs to define a national plan to reduce emissions based on an analysis of the drivers of deforestation and in consultation with relevant actors**
- **Monitoring: A basic system of monitoring and verifying would be designed and implemented**

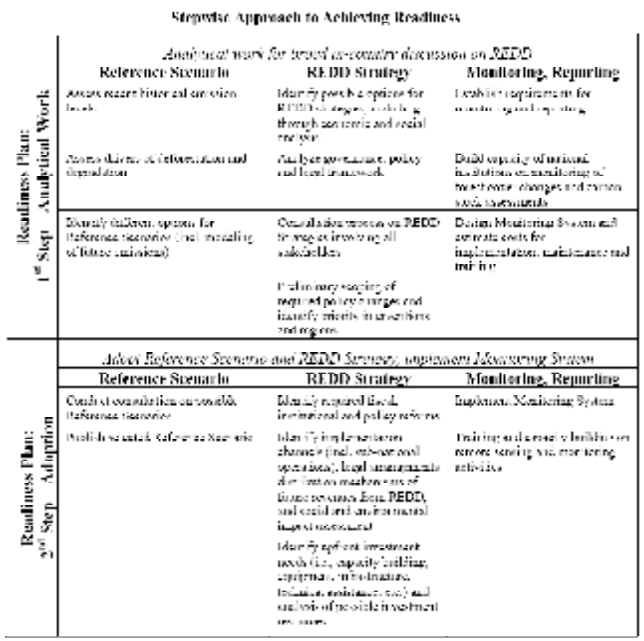
Readiness Plan Idea Note

Readiness Plan Idea Note

In the R-PIN the Country addresses the following issues based on available data and information:

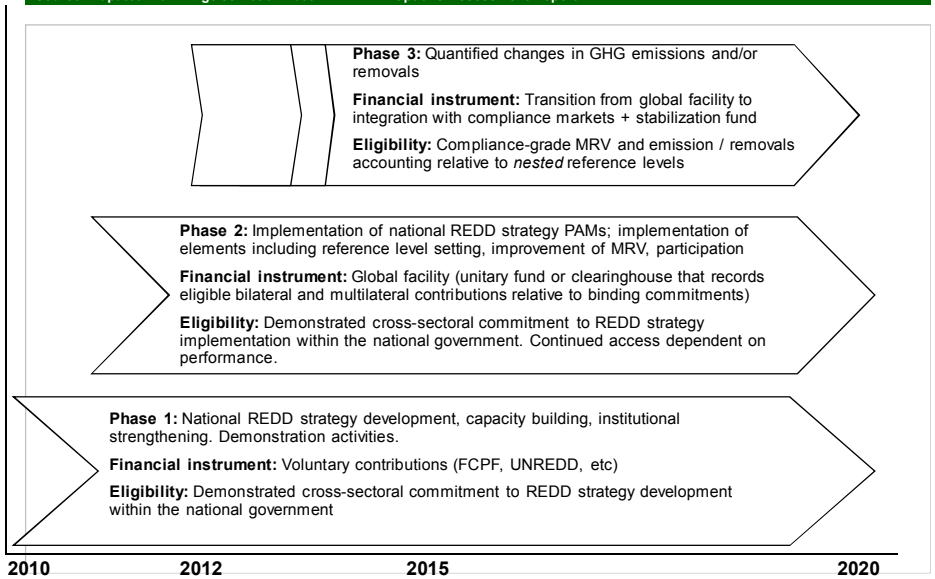
- **Statement of the deforestation and degradation problem:** Information on the drivers and agents of deforestation and degradation; estimations of total land area subject to deforestation and degradation and resulting emission levels; and location and types of forest ecosystems.
- **Responsibilities and legal framework:** Roles of the relevant institutions and agencies (at federal, state and municipal levels) responsible for policy and program implementation and law enforcement, monitoring and promotion of sustainable land use strategies; legal framework for these activities; and designation of the national focal point for REDD activities.
- **Current strategy:** Description of the activities currently under implementation by the Government and stakeholders; challenges for further improvement; methods for measuring emissions, including uncertainties and data gaps; and description of the way that different stakeholders, including forest-dependent indigenous peoples and other forest-dependent communities participate in the design and implementation of those strategies or national plans.
- **Assistance requested:** Listing of the areas where the country requests support from the Readiness Fund, including historical emissions and modeling of future emissions from deforestation and degradation; adoption or review of national REDD strategies; design and implementation of a Monitoring System; financial assistance for consultations with stakeholders; capacity building and technical assistance at different levels.

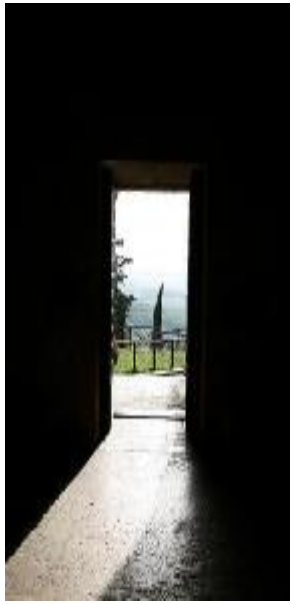
Readiness Plan



A Phased Approach

Source: Adpated from Angelsen et al. 2009. REDD: An Options Assessment Report





Other Initiatives

- **UN-REDD: $35M**
- **Norway: $500M/year for 5 years**
- **Germany: $2.8B over 5 years**
- **Australia: $180M over 5 years**
- **England**
- **Denmark**

REDD

Thank you!

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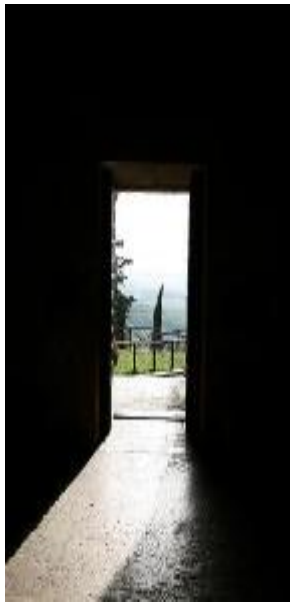
The Nature Conservancy
Rainforest Alliance
WWF for a living planet
gtz



Contributors

- **Contributors to this presentation include:**
  - **Rane Cortez (TNC)**

Social and Environmental Considerations of REDD

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Contents

Could REDD be win-win-win?

Potential Social Benefits and Risks

Potential Environmental Benefits and Risks

Work groups

Could REDD be win-win-win?

- *Climate* benefit
  -Cut up to 20% of global emissions
- *Biodiversity* benefit
  -Prevent loss of richest habitat for biodiversity
- *Social* benefit
  -Revenues & more for local people

Potential Social Benefits

- Economic benefits
- Long-term revenues for local people
- Job creation
- Capacity building
- Potential for complementary activities
  - sustainable forest management
  - ecotourism
- Maintain traditional livelihoods/cultural values associated with forests

Potential Social Benefits (more…)

- Improved provision of other ecosystem services
  - Water quality/regulation
  - Soil conservation
  - Reduced disease risk
  - Reduced fire risk
  - Maintain populations of pollinators

Social Risks

- Loss of control of forests to government / elite
- Evictions/expropriations
- Unequal/abusive contracts
- Reduced access to land for cultivation
- Potential social conflicts due to rearrangement of power/wealth
- Increase in food and other commodity prices
- Corruption, lack of accountability, transparency

Maximizing Benefits and Reducing Risk

- Include participation of forest-dependent people in design of REDD mechanism
- Mechanism must include safeguards
  - respect customary and traditional tenure and use rights
  - require free, prior, and informed consent
- Could include ‘pro-poor’ provisions
- Develop market for REDD projects with exceptional social benefits?

Maximizing Benefits and Reducing Risk (more…)

Policy recommendations from Peskett et al 2008 *draft Making REDD work for the poor.*

- Provision of Information at national and local levels
- Provision of upfront finance and other mechanisms to reduce cost
- Use soft enforcement risk
- Prioritize pro-poor policies
- Provide technical assistance
- Strengthen local institutions and access to legality
- Maintain flexibility in design of REDD mechanisms
- Clear definition and equitable allocation of REDD rights

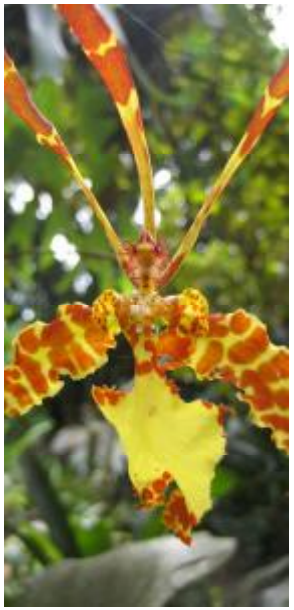
Maximizing Benefits and Reducing Risk (more…)

Policy recommendations from Peskett et al 2008 *draft Making REDD work for the poor*.

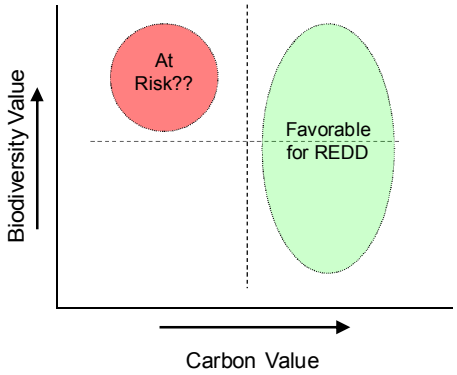
- Development and application of social standards
- Balance rigor and simplicity
- Ensure broad participation in the design and implementation of REDD
- Measures to improve the equity of benefit distribution
- Avoid perverse effects of REDD
- Ensure accountability and transparency
- Alignment with financial and development strategies
- Ensure longevity in REDD mechanisms
- Use broad definitions for land use types

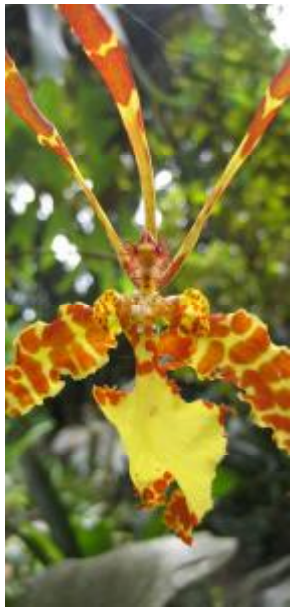
Potential Environmental Benefits

- Biodiversity Conservation
- Maintenance of other ecosystem services
  - Rainfall regulation
  - Water quality/regulation
  - Soil conservation
  - Reduced disease risk
  - Reduced fire risk
  - Maintain populations of pollinators
  - cultural values
- Allow for complementary activities
  e.g. tourism, timber, others

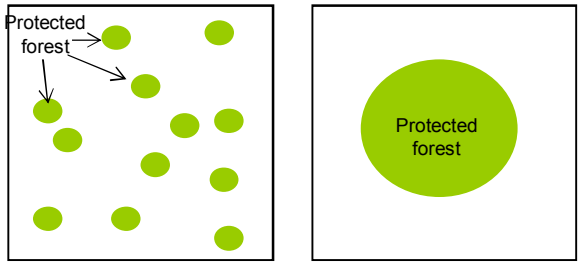


Environmental Risks: low carbon/high biodiversity areas





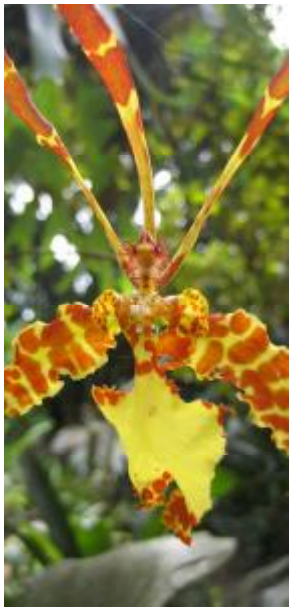
Environmental Risks: maintaining ecosystem function



Bad for biodiversity?
Small forest remnants with low connectivity

Good for biodiversity?

Maintains viable plant & animal populations



Other environmental risks?

- Forests are only valued for their carbon stock value.
- International leakage may occur if not all countries participate in REDD.

Maximizing Benefits & Reducing Risk

- Scheme must reduce international leakage
- Policies to reduce land conversion in low carbon/high biodiversity areas.
- Price premium for REDD in exceptional biodiversity areas?
  Apply standards like CCBA gold level
- Need for monitoring of land conversion in all habitats.

Questions for group work

Social aspects

1) What groups could benefit from REDD? What benefits will they obtain?
2) What groups are most at risk from REDD? What are these risks (use the matrix)
3) How can the risks be mitigated?

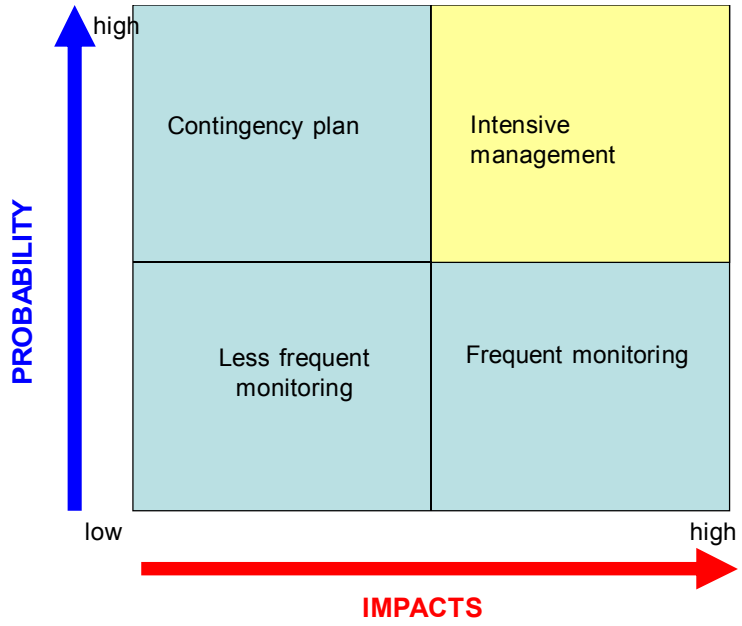
Environmental aspects

What are the zones of high rates of deforestation and degradation in your country?

Do these zones have a REDD value – do they have high carbon value and can the presures be controlled?

Are these zones also priorities for biodiversity?

Are there any risks of displacement of pressures to sites of lower value for carbon that are important for biodiversity?



Sites/regions with a high rate of deforestation or deagrdation	REDD potential: emissions avoidable (many/few)	Biodiversity conservation priority (high/low)	Risks of displacement of pressures to sites of lower carbon value but with biodiversity importance ?

REDD

Thank you!

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References on Social Considerations of REDD

- Peskett, et al. Making REDD work for the poor Draft 2, May 2008.
- Smith, J. and Scherr, SJ 2002. Forest Carbon and Local Livelihoods: Assessment of Opportunities and Policy Recommendations.
- Griffiths, T. 2007. Seeing 'RED' 'Avoided Deforestation' and the rights of indigenous Peoples and local communities.
- Peskett, L. and Harkin, Z. 2007. Risk and responsibility in Reduced Emissions from Deforestation and Degradation.

Références

Kapos, V. et al. 2007. Reducing Emissions from Deforestation: A Key Opportunity for Attaining Multiple Benefits

CCBA. The Climate, Community & Biodiversity Standards.

Contributors

- **Contributors to this presentation include:**
  - **Steve Panfil (CCBA)**
  - **Joanna Durbin (CCBA)**

Project Standards

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Contents

Purpose of Standards

Characteristics of Standards

Comparison of Standards

CCB Standards

Standards: Definition

Set of rules or codes mandating or defining product performance (e.g., grades, dimensions, characteristics, test methods, and rules for use). **Product, technology or performance standards** establish minimum requirements for affected products or technologies. Standards impose reductions in GHG emissions associated with the manufacture or use of the products and/or application of the technology.

Glossary- 3rd IPCC Assessment Report

Needs from standards? Group work

- Project owner
- Project developer
- Project investor
- Government
- Broker
- Final user of the carbon credits – offset buyer

Purpose of Standards

- Create an understandable and credible product (real and additional)
- Create fungibility (tCO2e, approved methods for quantification, leakage taken into account)
- Reduce risks (non-permanence, social, environmental)
- Differentiate projects by quality of co-benefits (social, biodiversity, etc.)
- Stimulate markets

Characteristics of Standards

This is achieved by:

- Applying an approved carbon accounting methodology
- Validating that the methodology has been applied correctly
- Verifying that the GHG emissions reductions and other benefits claimed by the project have been achieved

Characteristics of Standards

- Rigorous and objective criteria and indicators
- 3rd party evaluation – independent
- Auditor accreditation
- Validation & Verification
- Transparency
- Public Comment period
- Certificate Issuance/registry

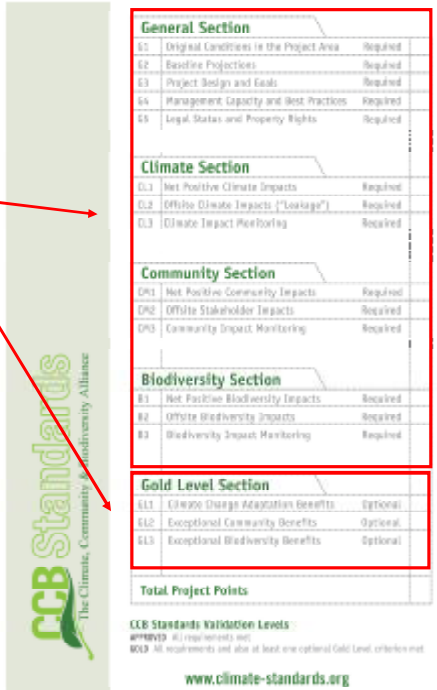
Comparison of Standards

- Compliance or Voluntary
- Applicability to REDD
- Carbon Verification
- Multiple benefits

	Description	Land-based project types?	Carbon accounting verification	Environmental and social benefits	Notes
CDM	Kyoto-compliant scheme – Full offset standard	A/R	Yes - CERs	Basic	Few A/R projects to date
Voluntary Carbon Standard (VCS)	Carbon verification standard for voluntary market	A/R, REDD, Agriculture, Improved Forest Mgmt	Yes- VCUs	No	Risk analysis and buffer for permanence
Gold Standard (GS)	Full carbon offset standard	No	Yes	Better	No AFOLU projects
VER+ (TuV SuD)	Full certification for offsets	A/R	Yes	No	Similar to CDM without limitation to non-Annex 1
Voluntary Offset Standard (VOS)	Offset screening for projects adhering to CDM, JI , and GS methodologies	CDM A/R	CDM or GS	No	New - In development
Climate, Community and Biodiversity (CCB)	Multiple-benefit project design standard	All land-based projects	No	Better	Project design standard for co-benefits
California Climate Action Registry	A registry protocol	Forestry	Yes	No	California only
Plan Vivo	Project development support for rural multiple-benefit projects	Forestry and agriculture projects	Yes – monitoring required	Better	Third-party verification optional
Social Carbon	Methodology and certification for multiple-benefit land-based project	All land-based projects	In development	Better (social)	South America and Portugal to date
CarbonFix (CFS)	Project standards designed to promote sustainable forest management	A/R	Yes	Basic	

How do the CCB Standards work?

- Evaluation according to criteria in 4 sections - general, climate, community and biodiversity
- 3 optional Gold Level criteria identify projects that generate exceptional benefits
- Project information posted on the internet for public comment – 30 jours
- Projects are validated/verified by third party auditors approuved by CCBA (CDM, FSC, VCS)
- Vérification every 5 years
- 8 projects validated to date, 15 undergoing validation and > 100 using standards



Role of CCB Standards

Stand Alone *Project design standards*	With a carbon accounting standard ; CDM, VCS, etc. *Multiple benefit standards*
Validation of the design, the relevance to the local context and the potential to generate siginificant benefits for the climate, local communities and biodiversity	Benefits to society and biodiversity verified
No emissions reductions certificates	Emissions reductions certificates delivered
The standards help with integrated design of projects and attract investment and stakeholder support at the early phases of project development.	The standards enable investors to choose carbon credits that also generate multiple social and biodiversity benefits

Costs and Time (CCB Standards)

- CCB Standards Auditors
  Rainforest Alliance, TUV SUD, SGS, SCS…
  US$7,000-40,000 for validation
- 2 months+
  - Desk Review
  - Public Comment Period (21 days)
  - Site Visit
  - Resolution of non-conformity

Carbon accounting standards + CCB Standards

Credibility of GHG reductions

- Additionality
- Mesurement and monitoring
- Leakage
- Permanence
- Registration

Project design and social and environmental impacts

- Local communauties
- Biodiversity
- Ecosystem services
- Durability
- Adaptation to climate change

VCS VOLUNTARY CARBON STANDARD

www.v-c-s.org

CCB Standards
The Climate, Community & Biodiversity Alliance

www.climate-standards.org

REDD

Thank you!

REDD Training Course

CCBA · Conservation International · The Nature Conservancy · Rainforest Alliance · WWF for a living planet

Contributors

- **Contributors to this presentation include:**
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  - **Steve Panfil (CCBA)**

Overview of Forest Carbon Project Cycle

REDD Training Course

Contents

What makes a forest carbon project unique?

Similarly to other conservation projects, a forest carbon project:

- Requires multiple partners with different areas of expertise
- Involves local communities, governments, and indigenous groups
- Needs a clear vision, concrete goals and specific implementation plans

Unlike many other conservation projects, a forest carbon project:

- Has an implementation horizon **of 20 to 100 years**
- Will require ongoing, active management, with consequences for under-performance
- Will create a legal asset with an economic value – a potentially tradable 'carbon credits' – which must represent real, measurable tons of carbon

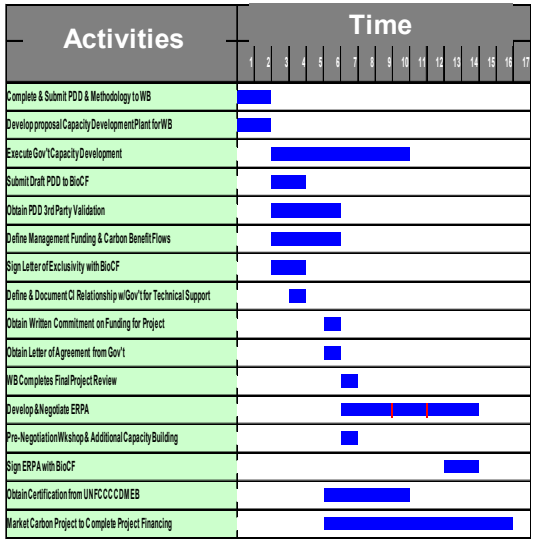
Importance of the project developer or catalyst in project planning

Leadership (and vision) is required to bring all the partners to the table at the start of the process. The project developer must:

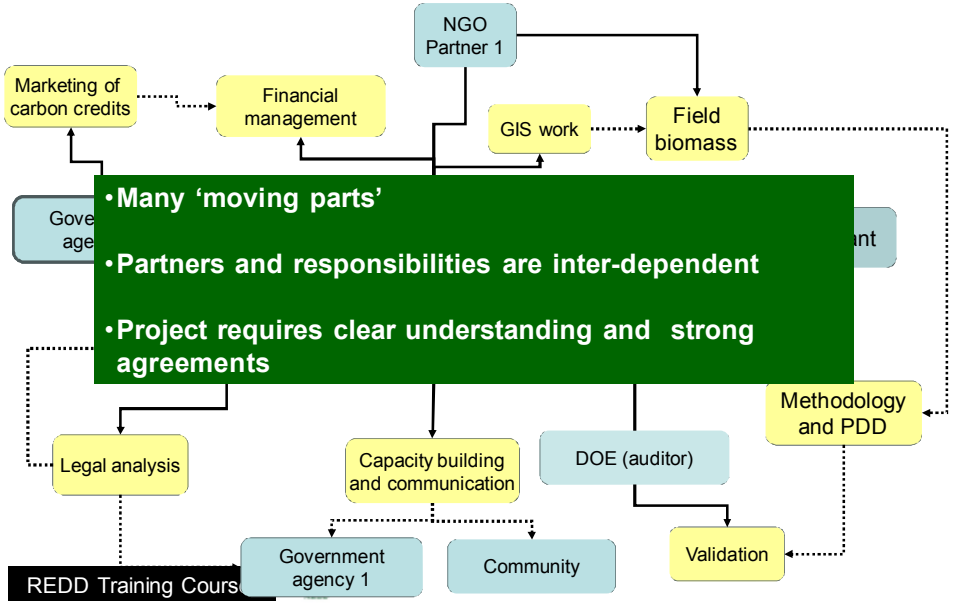
- Need to agree on the purpose, goals and objectives from the beginning to avoid misunderstandings and problems
- Convene partners early and often during the planning process
- Create capacity building is extremely important-this is the first time many partners are involved in forest carbon projects under legal agreements.

Role of project developer in project planning

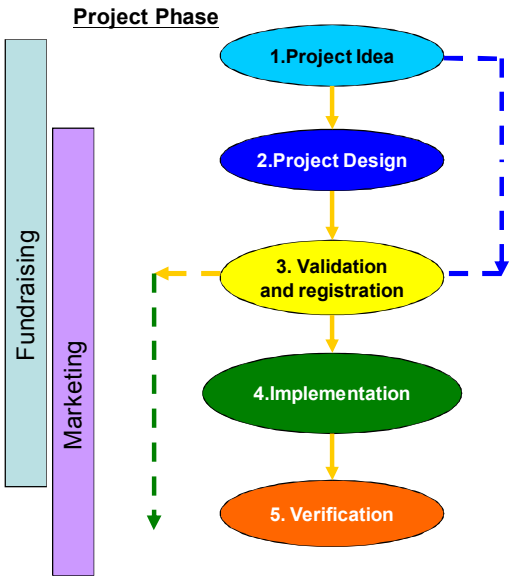
- The project developer or catalyst will (at least initially) serve as a focal point for project planning and coordinate work plans, timelines, and budgets
- May or may not serve as the official project proponent, or 'seller' of carbon credits, in the long term
- Requires an understanding of what products are required and when - and what expertise is required to deliver those products



A hypothetical project structure - relationships of partners and deliverables



What are the key phases?

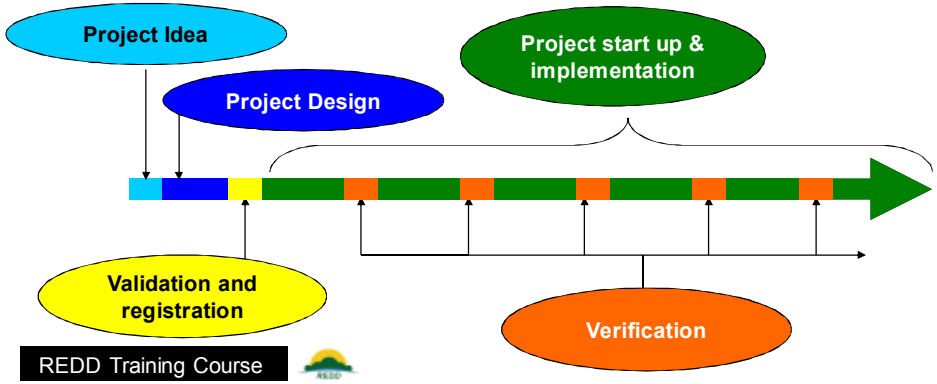


Purpose

- Create concept and undertake feasibility study
- Outline steps and methods in Project Design Document (PDD)
- Audit and approve project methodology
- Plant trees or protect forest
- Quantify actual emissions reductions

Timing - project planning and the project cycle

- **Project phases don't always have concrete start and endpoints**
- **Various inputs (time, funding, or expertise) are required at specific points of the process**
- **Various deliverables are required at certain times before the next step can begin**



Project Idea Phase: Scoping and definition

Project Idea → Project Idea Note (PIN) or concept note

- **Define project scope/ concept**
  Reforestation or REDD?
- **Identify project area**
  Geographic boundaries of activities? Private or public land? Is land eligible for carbon project?
- **Identify potential partners**
  Landowners, communities, partner NGOs, etc.
- **Examine legal feasibility**
  Who owns CO_2 credits? Is project allowed under national law? What are the requirements to implement?
- **Begin stakeholder engagement**
  What groups will be affected?
- **Determine preliminary feasibility**
  Can the project work?

Identification of goals and objectives

- •Biodiversity priorities, social benefits, emissions reductions
- •Workshops and partner meetings, 1-2 months
- •Costs: Travel and logistics

Legal feasibility

- •Secure land tenure? Carbon rights? Legal framework for PES?
- •Lawyer, Consultancy or NGO, 2-4 months;
- •Costs: Consultant fees

Project Idea

- •Partnership structure
- •Definition of roles, responsibilities, financial agreements
- •Project leader and partners 2-6 months
- •Costs: Travel, meetings, lawyers

Project Idea

Fundraising from donors and partners

Project Design

Initial community and landowner consultations

- •Landowners and local government receptive to project?
- •Local NGO or community group 1-3 months
- •Costs: Travel, meetings

Background information compilation

- •Biogeophysical info, site information, socioeconomic analysis
- •Mostly in-house, some consultancy possible, 1-6 months
- •Costs: Staff time, consultant fees

Notes on Project idea phase

Project Idea

- **Fundraising is important during the early stages of project,**
  Could include projects funded by development agencies (ODA), traditional conservation donors, and early-stage investors
- **Government interaction is important during this stage to ensure buy-in and support**
  National or state laws may need clarification to proceed
  For CDM projects, early involvement and approval of the DNA or other agencies is essential
- **Compiling background information early is important to developing concept notes and proposals for funding**
  Funders increasingly want to see realistic carbon calculations early in the investment phase
  Project manager should provide evidence of partner capabilities and stakeholder buy-in to demonstrate project has lower risk

2. Project Design Phase: Methods and steps

2.Project Design → Project Design Document (PDD)

- **Define activities and interventions**
  How will the project protect standing forests? Which partner will take what role?
- **Determine expected emissions reductions**
  How will the project calculate GHG benefits? What carbon pools will be measured? How often?
- **Consult with local communities and stakeholders**
  What are the social and environmental impacts? How will the project respond to stakeholder concerns?
- **Analyze the financial costs and legal issues**
  What are the up-front costs and what are the expected financial flows over the life of the project? What agreements must be signed?

Expertise required:

- GIS/remote sensing
- Field biomass measurement
- Financial planning
- Community engagement
- Legal structures

Carbon baseline analysis

- Forest and land stratification, biomass plots
- Forestry consultant 3-6 months
- Costs: Consultant fees

Activities definition

- Species selection, planting plans, alternative livelihood activities
- Forestry expertise, community engagement
- Costs: Consultant or partner costs, travel and meetings

Project Design Document (PDD)

- Integration of project and baseline pieces
- Experienced consultant
- Cost: Consultant fees

Project Design

Financial planning should commence early & is an ongoing process during the project design phase.

Developing legal agreements with partners solidifies partner commitments & expectations.

Spatial land use analysis

- Historical deforestation analysis, project and site boundary definition, eligibility
- GIS and remote sensing capacity, 6-12 months
- Costs: Data and images, staff or consultancy time

Project methodology selection and application

- Selection or development of methodology, calculation of ERs, monitoring plans
- Consultant; 6-18 months
- Costs: Consultant fees

Implementation

Standards for forest carbon projects

Carbon accounting standards for forest projects:

- **CDM – Clean Development Mechanism**
  Regulatory markets – Afforestation, Reforestation only (REDD projects are not included yet)
- **VCS – Voluntary Carbon Standard**
  Voluntary market – A/R, REDD, Agricultural land management and improved forestry (SFM or similar)

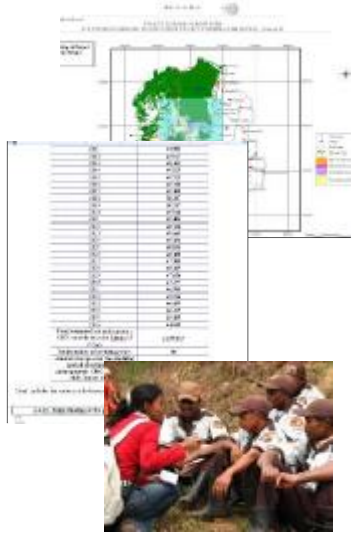
Co-benefits:

- **CCBA – Climate Community and Biodiversity Standards**
  Regulatory or voluntary market – all land use projects (A/R, REDD, etc) – used to demonstrate co-benefits

Project Design Document (PDD) – **What questions does it answer?**

Project Design

- What are the expected GHG benefits of the project?
- How will they be estimated, and how will they be monitored after implementation?
- Where exactly will the project take place?
- Is the project truly additional?
- What social and environmental impacts (intentional or unintentional) might the project bring about?



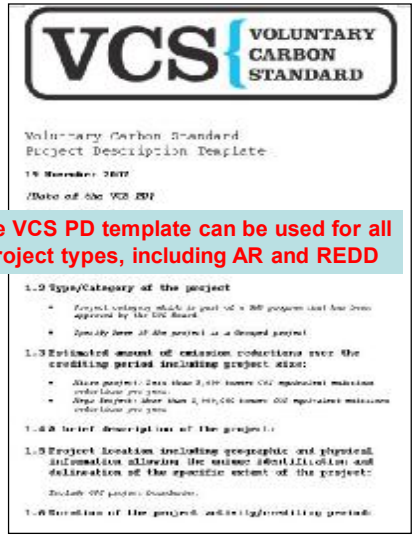
Project Design Document (PDD) for REDD projects - the VCS format

Project Design

All projects will need to develop a PDD or similar document

Many sections:

- **Description of project and duration**
- **Baseline methodology and emissions reductions calculation**
- **Monitoring plan**
- **Social and environmental impacts**
- **Stakeholder input**


VCS VOLUNTARY CARBON STANDARD

Voluntary Carbon Standard
Project Description Template

The VCS PD template can be used for all project types, including AR and REDD

Notes on project design phase

Project Design

- Financial planning is led by the project catalyst, but will involve close interaction with many project partners (funders, potential carbon buyers, communities, etc.)
- Legal agreements signed with partners formalize relationships and creates long term commitments ensuring that the project meets its goals
- Community and stakeholder meetings are the most important aspect to a project's long term success
- Baseline work, application of methodology, and PDD development often can be carried out by the same organization or consultant
- Spatial analysis, including REDD baselines, requires experience in remote sensing - but might be done by existing partners

3. Project Design Validation and Registration

Validation and registration → Project validated

Third-party auditor will determine:

- **Has the project used an appropriate methodology?**
  - Has it been applied correctly?
- **Have the appropriate steps been followed?**
  - Have stakeholders been consulted? Have local laws been upheld?
- **Is the project calculating its expected emissions reductions correctly?**
  - Has the baseline been determined correctly? Is the number of expected ERs correct?

Expertise required: Third-party auditor approved for this project type and standard

Project is registered certified to comply with a certain standard (e.g. CDM, VCS, CCB, etc)

4. Project Implementation

Implementation → Trees planted or forests protected

- **Sign and implement all landowner and partner agreements**
  - Lease land, negotiate site protection or maintenance contracts, government agreements
- **Implement project activities:**
  - Implement forest protection activities
  - Patrolling or monitoring, fire prevention, Conservation Incentive Agreements, etc.
  - Design alternative livelihood and community benefit activities
- **Monitor project impacts**
  - Monitor deforestation rates in project site
  - Monitor and mitigate leakage
  - Monitor Social and ecological impacts

Community engagement and education

- Capacity building (project basics and activity-specific)
- Project partners, community groups, and local government
- Costs: Meetings, trainings, travel

Validation

- Validation by standard (CDM, VCS, CCBA)
- Approved DOE (auditor) 2-4 months
- Cost: Consultant fees

Implementation

Monitoring underway

- Indicators and variables and data protocols selected, data collected
- Project developer and partners monitor for the life of project

Implementation

Carbon marketing and sales

Legal agreements in place

- Landowner and government agreements, carbon marketing and sales contracts, and benefit sharing structure
- Stakeholders and partners
- Cost: Staff and legal time

Project activities

- **A/R**: Nursery construction, seed collection, site preparation
- **REDD**: Activities to address D+D, community livelihoods

Verification

Demonstrate compliance with standard and project design

Approved DOE (auditor) 2-4 months
Cost: XXX

Notes on project start up & implementation planning

Implementation

- Project start up can begin slightly before validation, but activities and locations need to be fixed as early as possible
  - Once a project is validated, changes are harder or more expensive to make
- If communities do not see an immediate benefit, interest in project will fade quickly
  - Alternative livelihoods activities must begin at the same time, or prior to, forest protection activities
  - Requires up-front funding (prior to any carbon revenues) to implement any alternatives
  - Capacity building is important for communities to realize maximum benefits
- Legal agreements regarding financial issues (carbon marketing, revenue and benefits sharing, etc) should be reached as early as possible to avoid misunderstandings

5. Verification

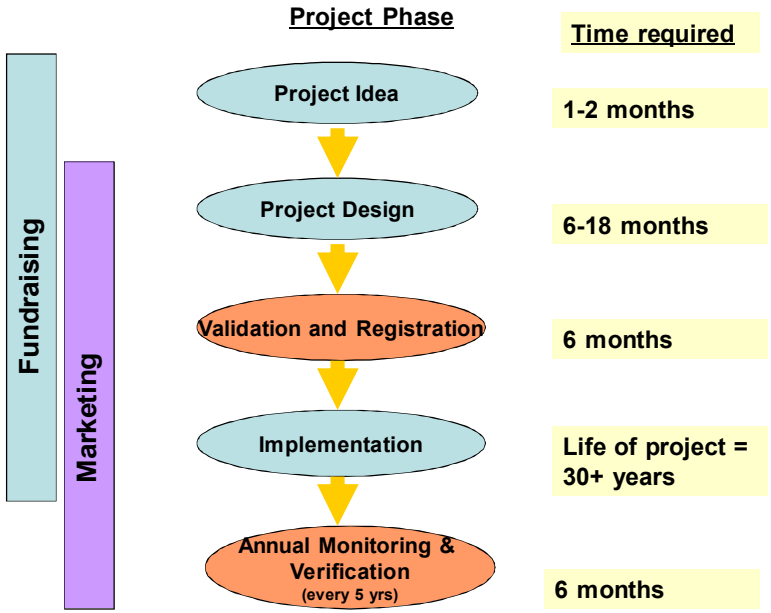
Verification → Project implemented properly and emissions reductions achieved

Third-party verifier (auditor) will determine:

- **Has the project been implemented according to the project design and methodology?**
  - Did the project do what it said it would?
- **Has monitoring occurred as planned?**
  - Quantity of real emissions reductions? Leakage monitored and/or mitigated?
- **What social and environmental impacts (expected or unexpected) have occurred mitigated?**
  - Have the benefits been realized? Negative impacts mitigated?

Expertise required: Third-party auditor approved for this project type and standard

Project is awarded and can sell emissions reductions (CERs, VERs, etc)



Take-home messages

- Project design and start-up can be a lengthy, complex and expensive process
- Important to identify project goals early to minimize changes along the way
- Identifying early on which methodology the project will apply is important
- A variety of expertise will be needed, both internal and external
- Project planning includes project technical aspects and also the essential partnering, financial and legal components.

REDD

Thank you!

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