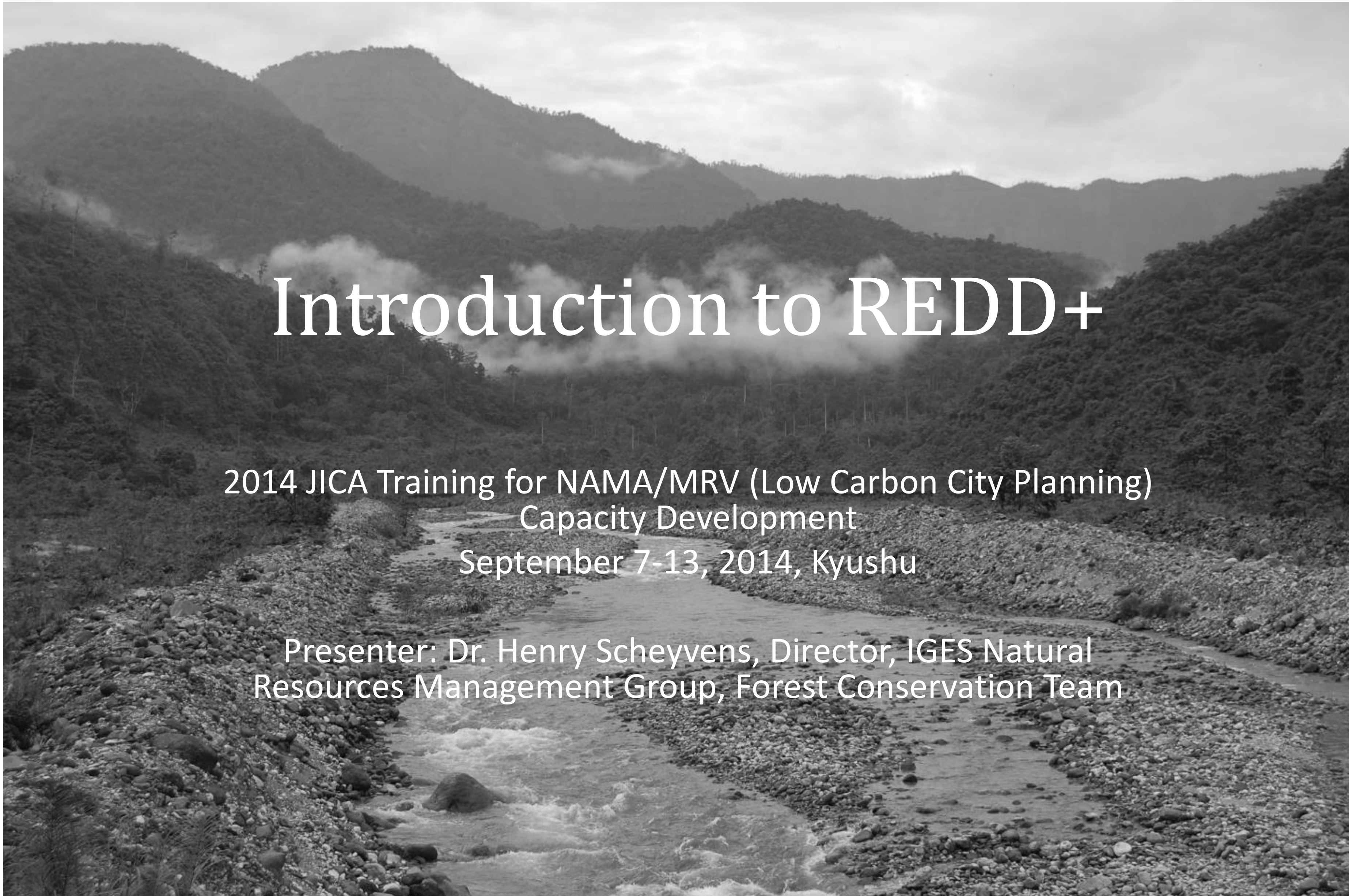


Introduction to REDD+

2014 JICA Training for NAMA/MRV (Low Carbon City Planning) Capacity Development

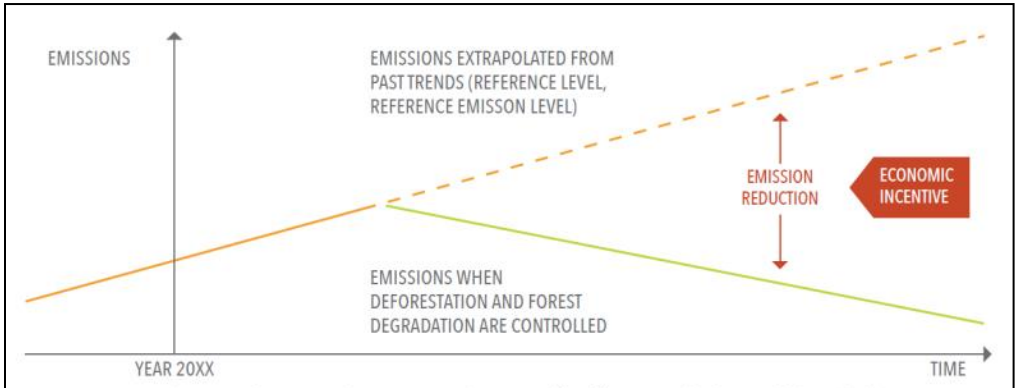
September 7-13, 2014, Kyushu

Presenter: Dr. Henry Scheyvens, Director, IGES Natural Resources Management Group, Forest Conservation Team

1. REDD+ Basics

What is REDD+?

- Developing countries receive payments for verified reduction of GHG emissions from forests and increasing removals of GHGs from the atmosphere by forests
- UNFCCC Definition: Encourages the following mitigation actions in the forest sector:
    - reducing emissions from deforestation and degradation in developing countries (=REDD)
    - conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries (= "+")



Source: Forestry and Forest Products Research Institute (2013) (http://www.ffpri.affrc.go.jp/redd-rdc/en/redd/basics.html)

Progress

- Global mechanism still being designed by UNFCCC parties
- About 60 countries globally establishing national REDD+ systems (readiness)
- Voluntary schemes have approved several REDD+ methodologies and REDD+ offsets being traded

How can REDD+ be implemented?

- Policies, e.g. introducing a law that prohibits forest conversion
- Measures, e.g. stopping illegal logging in a protected area

Is REDD+ needed?

1. **Huge global GHG emissions from forest sector**

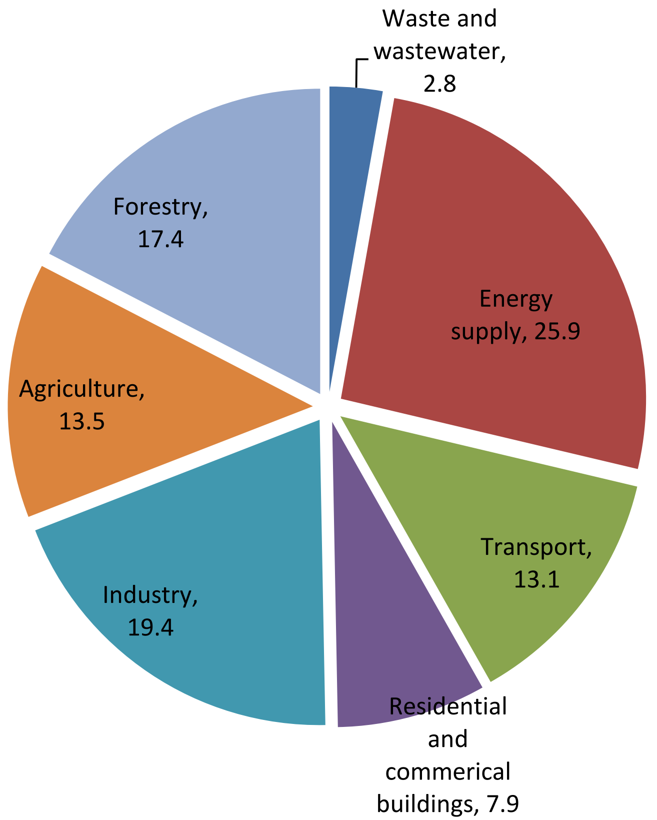
- Globally, on average 13 million hectares of forest were converted to other uses – mostly agriculture – or lost through natural events each year from 2000 to 2010 (FRA 2010).

- Deforestation and forest degradation account for 10 - 17% of global carbon emissions per year (IPCC 2007; Bulter, 2012); healthy forests absorb ~2.4 billion tons of carbon dioxide a year from the atmosphere (USDA, 2011).

- Without reducing forest loss in developing countries, it is highly unlikely that we could achieve stabilization of greenhouse gas concentrations in the atmosphere at a level that avoids the worst effects of climate change (Eliasch 2008).

Forests contain more carbon than the atmosphere and the world's oil reserves combined

Sources of GHG Emissions



Source: IPCC, 2007

2. Important to NAMAs in many tropical developing countries

GHG emission and removal (in Gg), 2000

	CO2 emission	CO2 removal	CH4	N2O	PFC	CO2e
Energy	247,522		1,437	10		280,938
Industry	40,342		104	0.43	0.02	42,814
Agriculture	2,178		2,419	72		75,420
LUCF	1,060,766	411,593	3	0.08		649,254
Peat Fire*	172,000					172,000
Waste	1,662		7,294	8		157,328
TOTAL	1,524,472	411,593	236,388	28,341		1,377,754

Source: Indonesia Second National Communication, 2009

- In Indonesia, land use change and forestry is responsible for about 47% of net CO2e emissions from anthropogenic sources.

3. High potential co-benefits:

- "Policy approaches and positive incentives for mitigation actions in the forest sector . . . can promote poverty alleviation and biodiversity benefits, ecosystem resilience and the linkages between adaptation and mitigation."

4. Limited alternatives:

- Diminishing international funding for forest conservation before REDD+ concept emerged

What are REDD+ assumptions? Are they realistic?

1. REDD+ can generate sufficient financial and other benefits to make it an attractive option to forest conversion and activities leading to degradation.

Opportunity	•*Direct, on-site* •profit difference between conserving forests and converting them to other, typically more valuable, land uses •the difference in profits from increasing carbon within forests or of restored forests •*Socio-cultural* •livelihoods restricted or changed •psychological, spiritual or emotional impacts •*Indirect, off-site* •difference in value-added activities (changes in economic sectors attributable to REDD+) •tax revenue differences •agriculture and forest product price increases from economy feedbacks (dynamic not static effects)
Implementation	•land use planning •land tenure / governance reform •forest protection, improved forest and agriculture management •job training •administration
Transaction	•REDD+ program development •agreement negotiation •emission reduction certification (measuring, reporting, verification: MRV) •stabilization, prevent deforestation moving to other countries (stop leakage)

Costs of REDD+

Source: WB et al. 2011. Estimating the opportunity costs of REDD+ - A training manual

Can REDD+ compete with typical land use changes?	
High-value agriculture Examples: soybean, oil palm or cattle on productive lands	Probably no
Mid-value agriculture Examples: soybeans, oil palm or cattle on normal quality lands	Maybe
Low-value agriculture Examples: shifting cultivation or cattle on marginal lands	No

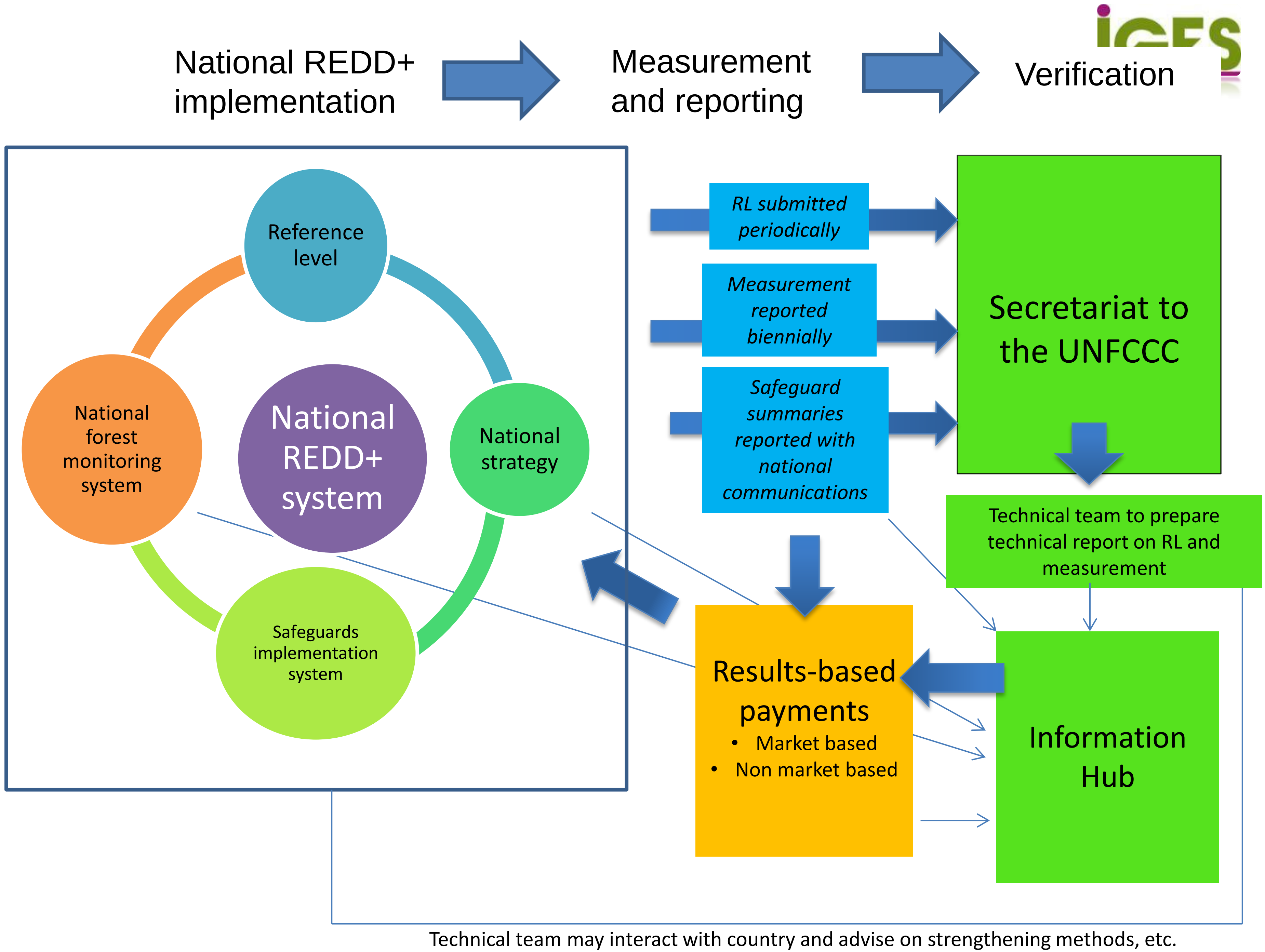
a carbon price of us$18-46 per ton of co2 would be needed to make REDD credits from forest conservation competitive with palm oil (Source: Tropical Forest Update 19/1)

2. REDD+ activities will be widely supported by the main forest stakeholders.

3. Accurate estimation of avoided emissions and increased removals is possible.

Agreed aspects and elements of the REDD+ framework in UNFCCC COP decisions

- **Scope**: REDD+ (evolved from RED to REDD to REDD+)
- **Scale**: National with sub-national as an interim measure
- **Phased approach**:
  - Phase 1: Readiness - develop strategies, policies/measures, build capacity;
  - Phase 2: Cont. Phase 1; implement strategies, policies and measures;
  - Phase 3: Result-based actions fully measured, reported and verified
- **Implementation**: National level
- **Verification and information hub**: UNFCCC
- **Finance**:
  - Can come from wide variety of sources (public, private, multilateral, bilateral, etc.)
  - COP could develop appropriate market-based and non-market based approaches



National REDD+ implementation
Measurement and reporting
Verification
Reference level
National REDD+ system
National forest monitoring system
National strategy
Safeguards implementation system
RL submitted periodically
Measurement reported biennially
Safeguard summaries reported with national communications
Secretariat to the UNFCCC
Technical team to prepare technical report on RL and measurement
Results-based payments
• Market based
• Non market based
Information Hub
Technical team may interact with country and advise on strengthening methods, etc.

REDD+ safeguards

- Consistency with national forest programs, international conventions and agreements
- Transparent governance structures
- Respect for knowledge and rights of Indigenous Peoples and members of local communities
- Full and effective participation of relevant stakeholders
- Conservation of natural forests and biological diversity
- Address displacement of emissions
- Address permanence

Financial and technical support for REDD+ capacity, readiness and activities

General Commitments of Support

Parties are invited to further strengthen and support ongoing efforts to reduce emissions from deforestation and forest degradation on a voluntary basis (2/CP.13. Par.1)

All Parties, in a position to do so, are encouraged to support capacity-building, provide technical assistance, facilitate the transfer of technology to improve, inter alia, data collection, estimation of emissions from deforestation and forest degradation, monitoring and reporting, and address the institutional needs of developing countries to estimate and reduce emissions from deforestation and forest degradation (2/CP.13. Par.2)

Parties, in particular Parties included in Annex II to the Convention, are invited to mobilize resources to support efforts in relation to the actions referred to in par. 1-3 of 2/CP.13, such as efforts, including demonstration activities, to address the drivers of deforestation (2/CP.13. Par.5)

All Parties in a position to do so are encouraged to support and strengthen the capacities of developing countries to collect and access, analyse and interpret data, in order to develop estimates (4/CP.15. Par.4)

Parties, in particular developed country Parties, are urged to support, through multilateral and bilateral channels, the development of national strategies or action plans, policies and measures and capacity-building, followed by the implementation of national policies and measures and national strategies or action plans that could involve further capacity-building, technology development and transfer and results-based demonstration activities, including consideration of the safeguards referred to in par. 2 of appendix I to decision 1/CP.16, taking into account the relevant provisions on finance including those relating to reporting on support (1/CP.16. Par.76)

Parties in a position to do so and relevant international organizations are invited to enhance capacity-building in relation to using the most recent IPCC guidance and guidelines, as adopted or encouraged by the COP, taking into account the work of the Consultative Group of Experts on National Communications from Parties not included in Annex I to the Convention (4/CP.15. Par.1c and 5)

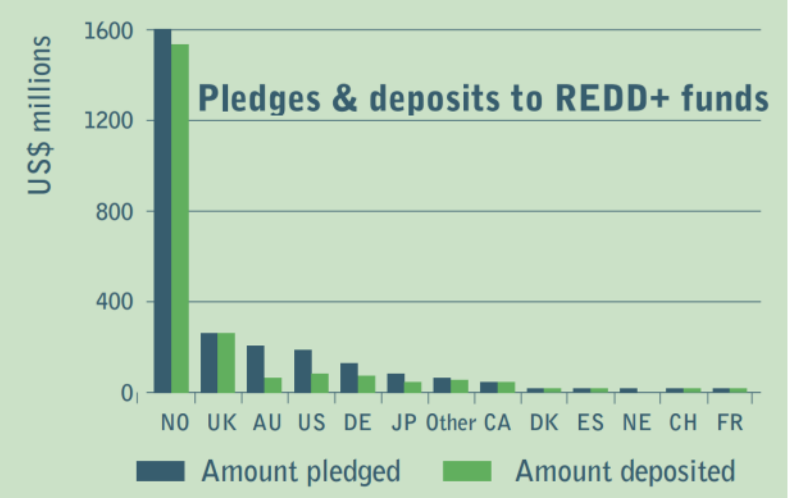
WWF

Union of Concerned Scientists
Science for a Healthy Planet and Safer World

Yale School of Forestry & Environmental Studies

Public funds

- UN-REDD supporting REDD+ readiness in 21 countries
- 57 countries participating in World Bank Forest Carbon Partnership Facility (FCPF)



Fund / Initiative	Pledged	Deposited	Approved	Disbursed	No of projects approved
Amazon Fund	1032.44	102.79	168.71	45.94	33
Forest Carbon Partnership Facility - Carbon Fund (FCPF-CF)	218.3	138.1	0.57	0.2	1
Forest Carbon Partnership Facility - Readiness Fund (FCPF-RF)	239.4	212.59	31.03	11.46	27
Forest Investment Program (FIP)	612	446	50.96	3.59	24
Norway International Climate and Forest Initiative (ICFI)	1,607.82	1,607.82	533.21	276.44	13
UN-REDD	151.49	118.89	116.13	97.93	18
Australia's International Forest Carbon Initiative (IFCI)	216.27	67.06	125.54	31.7	9
Congo Basin Forest Fund (CBFF)	165	165	95.38	18.59	37

US$ million

Source: ODI 2012

Financing REDD+: Voluntary markets

- Forestry and land use activities accounted for 32% (REDD 9%) of voluntary trade in 2012.
- 28 $MtCO_2e$ of carbon offsets from forestry projects in 2012, valued at $216 million, sold
- Most to multinationals for CSR policies or to demonstrate "climate leadership"
- Global average price for forestry offsets: 2012 $7.8/tonne; 2011 $9.2/tonne

Figure 2: Cumulative Forestry Offset Transaction Volume and Value, All Markets

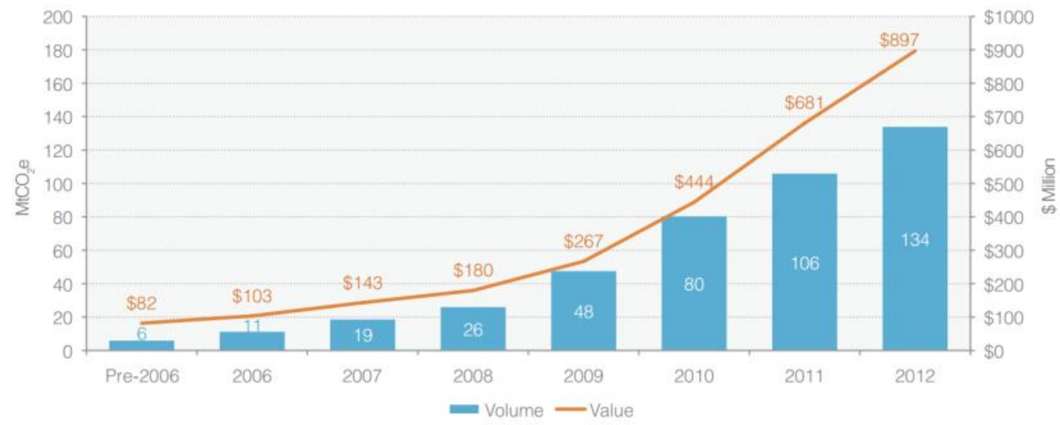
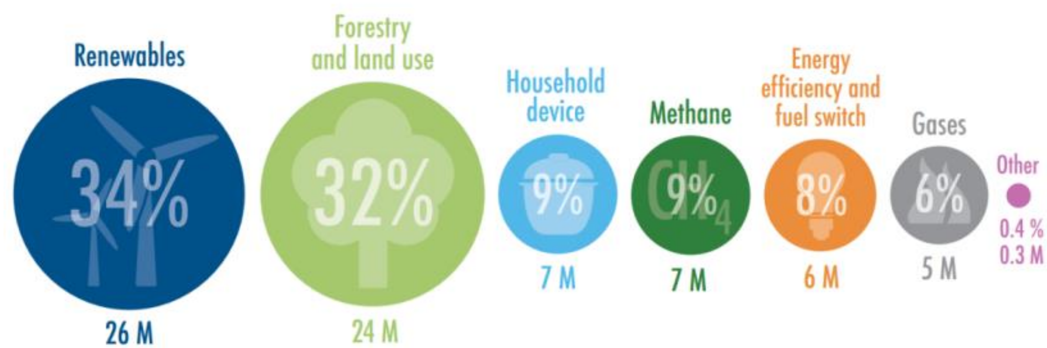
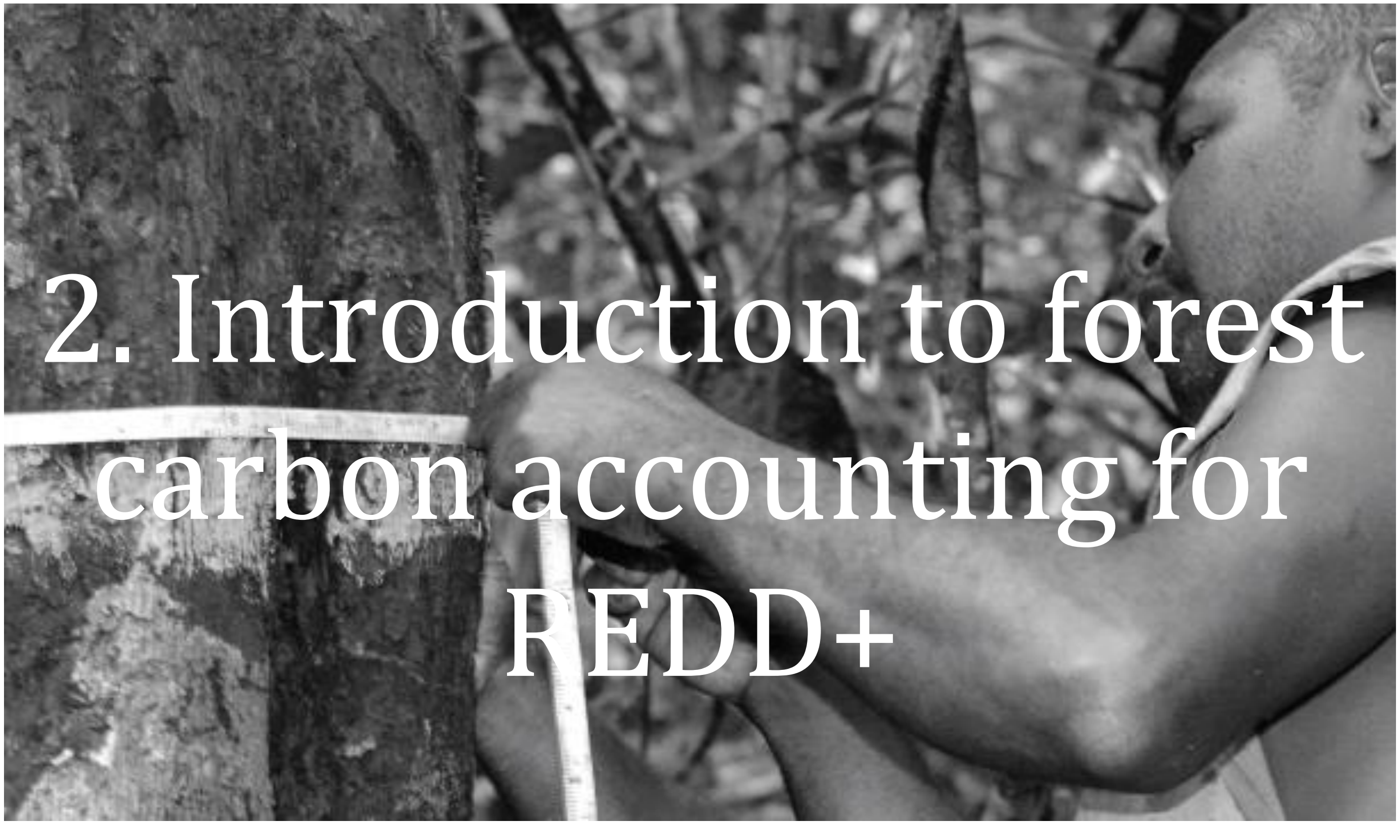


Figure 7: Transacted Volume by Project Category, OTC 2012 ($MtCO_2e$ and % Share)



Source: Forest Trends' Ecosystem Marketplace. State of the Voluntary Carbon Markets 2013.



2. Introduction to forest carbon accounting for REDD+

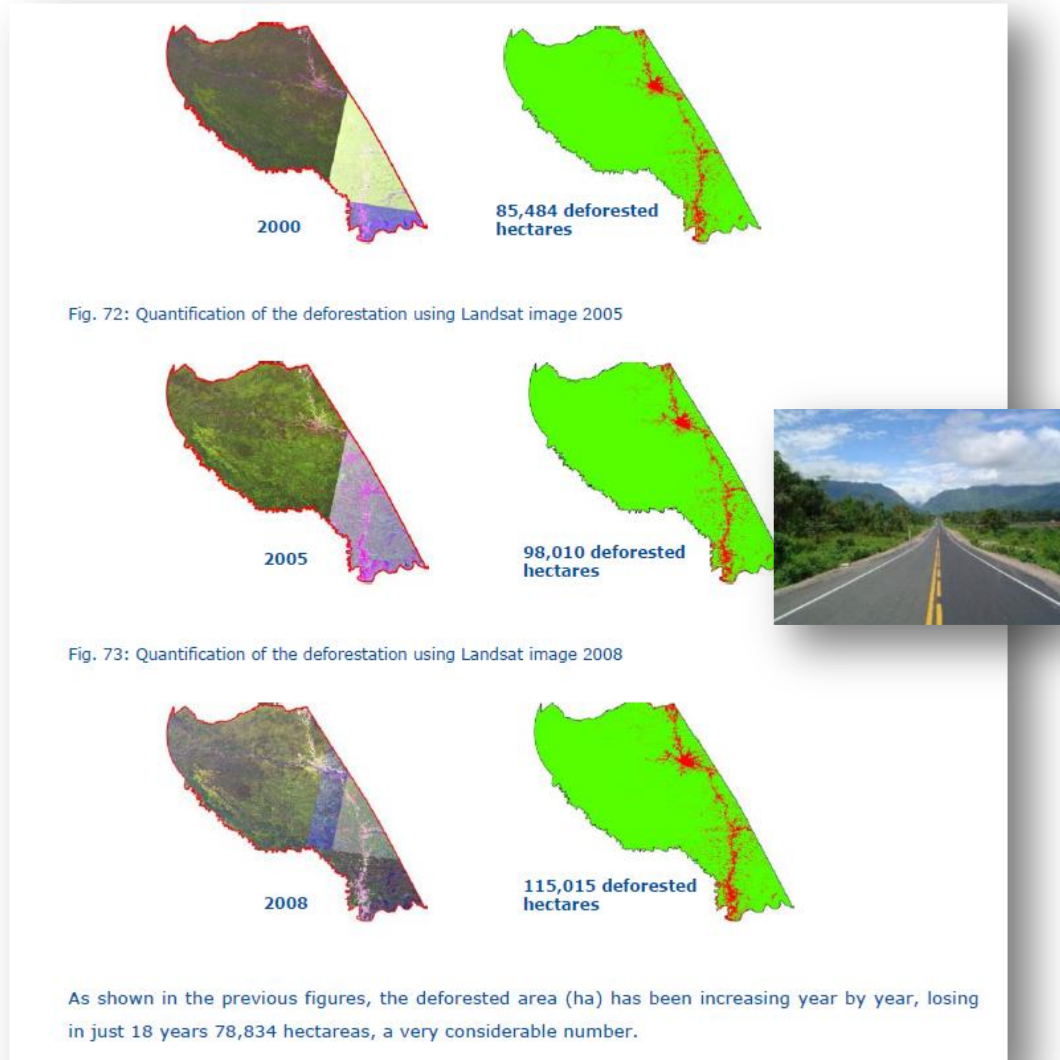
Fundamental elements

1. Develop reference level
    1. Study historical emissions and removals
        1. Map land cover (activity data)
        2. Estimate carbon stocks in each land cover class (emissions factors)
        3. Study of trends in drivers of DD and enhancement of C stocks
    2. Project how drivers will impact land cover in the future referring to historical trends and national circumstances
2. Estimate impact of REDD+ activities on carbon stocks
3. Monitor actual impacts
4. Monitor drivers and periodically review reference level

Data needed for RL

Data type
Spatially explicit data for stratifying lands
Spatially explicit activity data on gross deforestation and gross Forestation
Activity data for forest degradation and carbon stock enhancement
Key agents or proximate drivers of deforestation and degradation
Analysis of key pools
Estimates of emission factors for each stratum

Source: Govt. Norway 2011

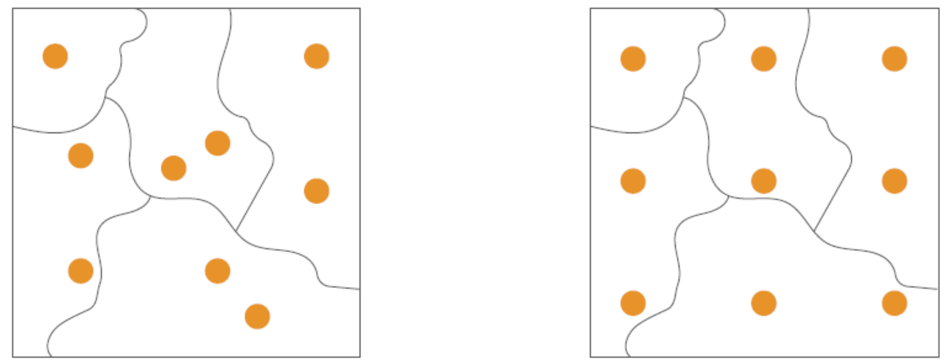


Five steps for developing a robust carbon stock assessment and monitoring plan

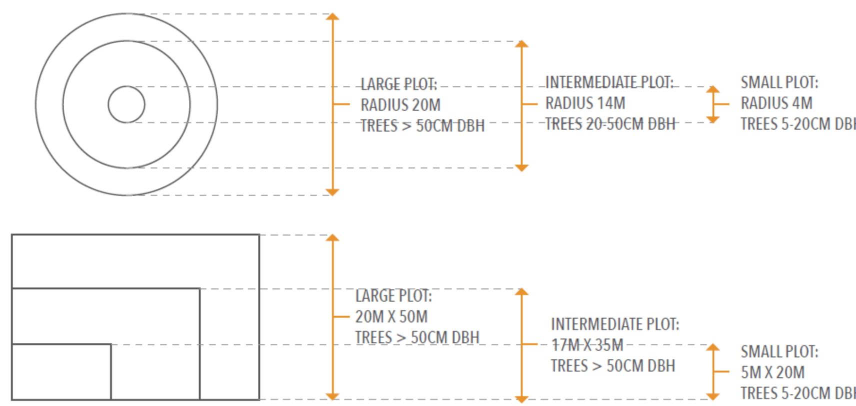
1. DEFINE PROJECT BOUNDARIES
2. STRATIFY PROJECT AREA
3. DECIDE WHICH CARBON POOLS TO MEASURE
4. DETERMINE TYPE, NUMBER AND LOCATION OF MEASUREMENT PLOTS
5. DETERMINE MEASUREMENT FREQUENCY

Sampling design

- For each carbon pool, need to decide on:
  - No. sample plots required (representative for sufficient accuracy and precision)
  - Plot location (unbiased and representative)
  - Plot dimensions
  - Temporary or permanent plots



Random vs systematic plot allocation



Circular vs rectangular plots

Forest carbon pools

- IPCC carbon pools
  - Group 1: Living biomass. This group includes (1) above-ground trees and (2) non-tree biomass and (3) below-ground biomass or roots.
  - Group 2: Dead organic matter. This group includes (4) dead wood and (5) litter.
  - Group 3: (6) Soil organic carbon. This group includes soil carbon.
- *To simplify, can ignore insignificant pools and apply conservative approach.*

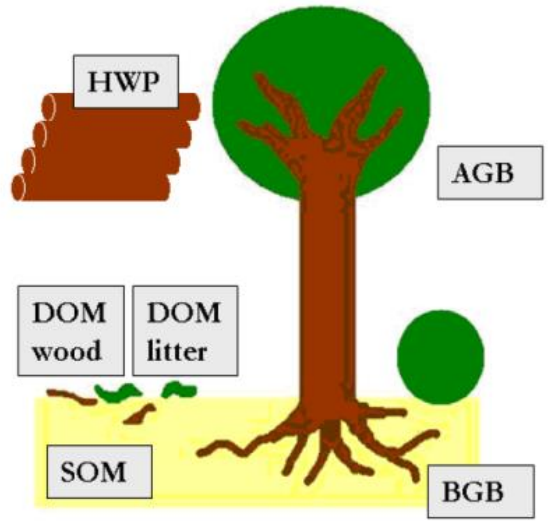


Figure 1. Diagrammatic Representation of Carbon Pools
(AGB above-ground biomass; BGB below-ground biomass; SOM soil organic matter; DOM dead organic matter; HWPs harvested wood products)

Example of how to estimate carbon in a pool: Above-ground trees

- Identify tree species
- Measure diameter at breast height
- Estimate height (optional)
- Apply allometric equation
- Total up for all trees in plot
- Expand total to 1 hectare

3. IGES Community Carbon Accounting Project

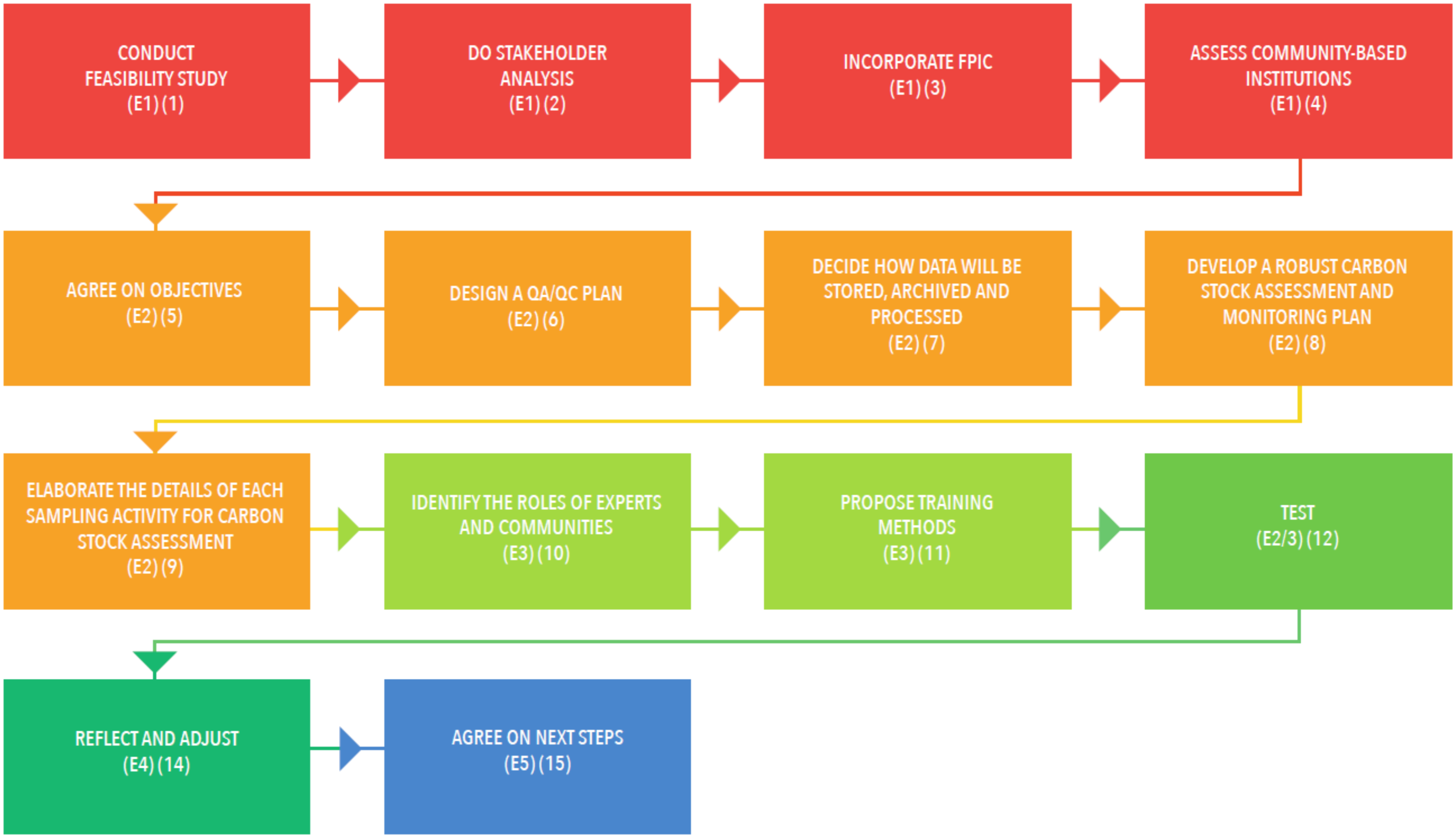
Overview

- Brings together the REDD+ safeguards and carbon stock assessment by engaging local communities in assessing and monitoring carbon stocks in their forest
- Research aim: To develop, test, implement and disseminate approaches to engage local communities in monitoring their forests, including changes in carbon stocks
- Development objective: Build capacity of local communities to consider REDD+ as a management option for their forests, communicate with outsiders on REDD+, and participate in an informed manner in REDD+ processes in their country

Decision 4/CP.15: The Convention of the Parties "encourages, as appropriate, *the development of guidance* for effective engagement of indigenous peoples and local communities in monitoring and reporting."

Project partners and sites

Steps to developing and implementing a community-based forest biomass system



Roles of facilitators and communities

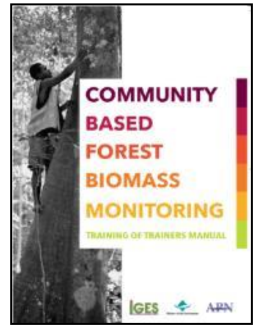
	EXPERTS/LOCAL LEVEL FACILITATORS	COMMUNITIES
Deciding CBFBM sites	▪ Responsible for analysing feasibility of CBFBM at sites, and for ensuring FPIC principles are fully implemented	▪ Decides whether to participate or not
Design of CBFBM system	▪ Facilitates a participatory design process	▪ Provides local knowledge on forest that may be relevant to design
Land cover / land use mapping and stratification	▪ Decides on technical issues and responsible for mapping using remote sensing and GIS ▪ Encourages communities to share their ideas for the mapping and facilitates sketch map drawing by the community ▪ Provides training on GPS and map reading ▪ Maps boundaries with communities ▪ Maps land cover and land use ▪ Designs the ground-truthing (ground-based survey to validate the maps)	▪ Shares expectations for the mapping ▪ Provides sketch maps ▪ Assists with interpreting features in satellite images ▪ Participates in ground-truthing ▪ Demarcates boundaries using GPS ▪ Can be involved in GIS when participatory GIS tools are used (see Session 3d Mapping of land cover / land use)
Position, set up and measure sample plots	▪ *Provides training on concepts and techniques, guidance and on-going support	▪ Leads (when competency is sufficiently built)
Additional technical work: destructive sampling, etc.	▪ Leads – explains purpose to communities	▪ Participates in field activities
Spread sheet design	▪ Leads	
Data entry and storage	▪ Usually responsible for data entry (If communities are responsible for data entry, experts must provide instruction on quality control, i.e. checking whether measurements recorded in the field are reasonable) ▪ Determines system for data storage and archiving	▪ May be responsible (can do data entry if some members have computer skills)
Quality assurance and quality control (QA/QC)	▪ Integrates into all aspects of CBFBM system ▪ Builds community awareness on importance of QA/QC	▪ Responsible for careful plot positioning and layout, measurement and recording
Analysis of future carbon scenarios (baseline vs alternative management options)	▪ Leads	▪ Provides local information for modelling scenarios (e.g. on extraction of fuelwood)
Interpreting results	▪ Leads – Explains results to communities	▪ May be able to assist with interpretation using local knowledge on forest conditions (e.g. spatial variation in biomass)
Deciding actions	▪ Agrees with communities on any actions	▪ Agrees with experts on any actions ▪ Can choose to withdraw consent for actions at any time
Future monitoring	▪ Proposes monitoring frequency and plays supporting role, including refresher trainings, if needed	▪ Continues to play key roles in monitoring

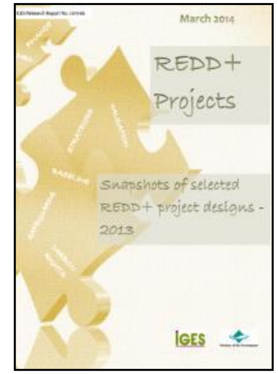
Community measurements reliable

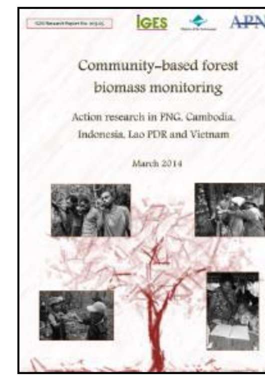
PROJECT SITES	FOREST TYPE	ESTIMATES FROM COMMUNITY MEASUREMENTS	ESTIMATES FROM PROFESSIONAL SURVEYS
IGES CBFBM PROJECT*			
Mondulkiri Province, Cambodia	Deciduous forest	75.5 ± 19.6 (SD) tC/ha for rectangular plots 72.2 ± 23 (SD) tC/ha for circular plot	73.8 ± 8.6 (SE)tC/ha (Vathana, 2010) Same forest patch
Yogyakarta & Central Java Provinces, Indonesia	Home gardens	34.2 ± 20.6 (SD) tC/ha	35.3 ± 21.2 (SD) tC/ha (Roshetko, Delaney, Hairiah, & Purnomosidhi, 2002) Different province
Madang Province, PNG	Mostly lowland and montane primary moist tropical forest (Hm class)	127.7 ± 40 (SD)tC/ha Biomass estimate for living trees with DBH > 5 cm and lying deadwood (~7% of tree carbon pool)	106.3 ± 22.7 (SD)tC/ha (Fox et al., 2010) Same province and forest type Biomass estimate for living trees with DBH > 10 cm
KYOTO THINK GLOBAL ACT LOCAL PROJECT**			
Dhaili, India	Even aged Oak forest	426.4± 36.6 (SE) tC/ha	453.3± 36.7 (SE) tC/ha
Dhaili, India	Dense oak forest	279.93.4± 40.5 (SE)tC/ha	283.4± 40 (SE) tC/ha
Dhaili, India	Degraded oak	38.1± 3.7 (SE) tC/ha	41.7± 4.6 (SE) tC/ha
Kitulangalo, Tanzania	Savanna woodland (miombo)	42.2± 4.4 (SE) tC/ha	43.2± 1.9 (SE) tC/ha***

Source:*(Scheyvens, 2012); **(Skutsch, Zahabu, Karky, & Danielsen, 2011)
Note: SD = 1 standard deviation; SE = standard error; *** Lower SE due to larger plot size

IGES resources







- Community carbon accounting
  - Manual: http://pub.iges.or.jp/modules/envirolib/view.php?docid=4999
  - Action research report: http://pub.iges.or.jp/modules/envirolib/view.php?docid=4999
  - Policy brief: http://pub.iges.or.jp/modules/envirolib/view.php?docid=4124
- REDD+ projects, national REDD+ systems and negotiations
  - IGES Online REDD+ database: http://redd-database.iges.or.jp/redd/

Contact me anytime for more information

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