Introduction to REDD+

2014 JICA Training for NAMA/MRV (Low Carbon City Planning) Capacity Development
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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 (= “+“)
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).

*Source: IPCC, 2007*
2. Important to NAMAs in many tropical developing countries

GHG emission and removal (in Gg), 2000

<table>
<thead>
<tr>
<th></th>
<th>CO$_2$ emission</th>
<th>CO$_2$ removal</th>
<th>CH4</th>
<th>N$_2$O</th>
<th>PFC</th>
<th>CO$_2$e</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy</td>
<td>247,522</td>
<td>1,437</td>
<td>10</td>
<td>0.43</td>
<td>0.02</td>
<td>280,938</td>
</tr>
<tr>
<td>Industry</td>
<td>40,342</td>
<td>104</td>
<td>43</td>
<td>0.02</td>
<td></td>
<td>42,814</td>
</tr>
<tr>
<td>Agriculture</td>
<td>2,178</td>
<td>2,419</td>
<td>72</td>
<td></td>
<td></td>
<td>75,420</td>
</tr>
<tr>
<td>LUCF</td>
<td>1,060,766</td>
<td>411,593</td>
<td>3</td>
<td>0.08</td>
<td></td>
<td>649,254</td>
</tr>
<tr>
<td>Peat Fire*</td>
<td>172,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>172,000</td>
</tr>
<tr>
<td>Waste</td>
<td>1,662</td>
<td>7,294</td>
<td>8</td>
<td></td>
<td></td>
<td>157,328</td>
</tr>
<tr>
<td>TOTAL</td>
<td>1,524,472</td>
<td>411,593</td>
<td>256,388</td>
<td>28,341</td>
<td>1,377,754</td>
<td></td>
</tr>
</tbody>
</table>

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.

Can REDD+ compete with typical land use changes?

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

Costs of REDD+

- 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)


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
Information

Technical team to prepare technical report on RL and measurement

RL submitted periodically

Measurement reported biennially

Safeguard summaries reported with national communications

Results-based payments
  • Market based
  • Non market based

Secretariat to the UNFCCC

Technical team may interact with country and advise on strengthening methods, etc.

National REDD+ implementation

Measurement and reporting

Verification

National REDD+ system

Reference level

Safeguards implementation system

National strategy

National forest monitoring system

Information Hub
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 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)

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)
Public funds

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

### Pledges & deposits to REDD+ funds

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

Source: ODI 2012

US$ million
Financing REDD+: Voluntary markets

- Forestry and land use activities accounted for 32% (REDD 9%) of voluntary trade in 2012.
- 28 MtCO2e 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

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

<table>
<thead>
<tr>
<th>Data type</th>
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</thead>
<tbody>
<tr>
<td>Spatially explicit data for stratifying lands</td>
</tr>
<tr>
<td>Spatially explicit activity data on gross deforestation and gross</td>
</tr>
<tr>
<td>Forestation</td>
</tr>
<tr>
<td>Activity data for forest degradation and carbon stock enhancement</td>
</tr>
<tr>
<td>Key agents or proximate drivers of deforestation and degradation</td>
</tr>
<tr>
<td>Analysis of key pools</td>
</tr>
<tr>
<td>Estimates of emission factors for each stratum</td>
</tr>
</tbody>
</table>

Source: Govt. Norway 2011

As shown in the previous figures, the deforested area (ha) has been increasing year by year, losing in just 18 years 76,834 hectares, a very considerable number.
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.
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

- **Site:** Hoa Binh Province, Vietnam  
  **Partner:** Vietnam Forestry University

- **Site:** Sangthong District, Laos  
  **Partner:** National University of Laos

- **Site:** Mondol Kiri, Cambodia  
  **Partners:** RECOFTC, WCS, Forestry Administration

- **Site:** Madang, PNG  
  **Partner:** FPCD

- **Site:** Central Java, Indonesia  
  **Partners:** National Forestry Council (DKN), ARuPA
Steps to developing and implementing a community-based forest biomass system

1. Conduct Feasibility Study (E1)(1)
2. Do Stakeholder Analysis (E1)(2)
3. Incorporate FPIC (E1)(3)
4. Assess Community-Based Institutions (E1)(4)
5. Agree on Objectives (E2)(5)
6. Design a QA/QC Plan (E2)(6)
7. Decide how data will be stored, archived and processed (E2)(7)
8. Develop a Robust Carbon Stock Assessment and Monitoring Plan (E2)(8)
9. Elaborate the Details of Each Sampling Activity for Carbon Stock Assessment (E2)(9)
10. Identify the Roles of Experts and Communities (E3)(10)
11. Propose Training Methods (E3)(11)
12. Test (E2/3)(12)
13. Reflect and Adjust (E4)(14)
14. Agree on Next Steps (E5)(15)
<table>
<thead>
<tr>
<th>Roles of facilitators and communities</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Expert/Local Level Facilitators</th>
<th>Communities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Deciding CBFM sites</strong></td>
<td>Decides whether to participate or not</td>
</tr>
<tr>
<td>- Responsible for analysing feasibility of CBFM at sites, and for ensuring FPIC principles are fully implemented</td>
<td></td>
</tr>
<tr>
<td><strong>Design of CBFM system</strong></td>
<td>Provides local knowledge on forest that may be relevant to design</td>
</tr>
<tr>
<td>- Facilitates a participatory design process</td>
<td></td>
</tr>
<tr>
<td><strong>Land cover/land use mapping and stratification</strong></td>
<td>Shares expectations for the mapping</td>
</tr>
<tr>
<td>- Decides on technical issues and responsible for mapping using remote sensing and GIS</td>
<td></td>
</tr>
<tr>
<td>- Encourages communities to share their ideas for the mapping and facilitates sketch map drawing by the community</td>
<td></td>
</tr>
<tr>
<td>- Provides training on GPS and map reading</td>
<td></td>
</tr>
<tr>
<td>- Maps boundaries with communities</td>
<td></td>
</tr>
<tr>
<td>- Maps land cover and land use</td>
<td></td>
</tr>
<tr>
<td>- Designs the ground-truthing (ground-based survey to validate the maps)</td>
<td></td>
</tr>
<tr>
<td><strong>Position, set up and measure sample plots</strong></td>
<td>Leads (when competency is sufficiently built)</td>
</tr>
<tr>
<td>- Provides training on concepts and techniques, guidance and ongoing support</td>
<td></td>
</tr>
<tr>
<td><strong>Additional technical work: destructive sampling, etc.</strong></td>
<td>Participates in field activities</td>
</tr>
<tr>
<td>- Leads – explains purpose to communities</td>
<td></td>
</tr>
<tr>
<td><strong>Spreadsheet design</strong></td>
<td>Leads</td>
</tr>
<tr>
<td><strong>Data entry and storage</strong></td>
<td>May be responsible (can do data entry if some members have computer skills)</td>
</tr>
<tr>
<td>- 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)</td>
<td></td>
</tr>
<tr>
<td>- Determines system for data storage and archiving</td>
<td></td>
</tr>
<tr>
<td><strong>Quality assurance and quality control (QA/QC)</strong></td>
<td>Responsible for careful plot positioning and layout, measurement and recording</td>
</tr>
<tr>
<td>- Integrates into all aspects of CBFM system</td>
<td></td>
</tr>
<tr>
<td>- Builds community awareness on importance of QA/QC</td>
<td></td>
</tr>
<tr>
<td><strong>Analysis of future carbon scenarios (baseline vs alternative management options)</strong></td>
<td>Provides local information for modelling scenarios (e.g. on extraction of fuelwood)</td>
</tr>
<tr>
<td>- Leads</td>
<td></td>
</tr>
<tr>
<td><strong>Interpreting results</strong></td>
<td>May be able to assist with interpretation using local knowledge on forest conditions (e.g. spatial variation in biomass)</td>
</tr>
<tr>
<td>- Leads – explains results to communities</td>
<td></td>
</tr>
<tr>
<td><strong>Deciding actions</strong></td>
<td>Agrees with experts on any actions</td>
</tr>
<tr>
<td>- Agrees with communities on any actions</td>
<td></td>
</tr>
<tr>
<td><strong>Future monitoring</strong></td>
<td>Continues to play key roles in monitoring</td>
</tr>
<tr>
<td>- Proposes monitoring frequency and plays supporting role, including refresher trainings, if needed</td>
<td></td>
</tr>
</tbody>
</table>
### IGES CBFBM PROJECT*

<table>
<thead>
<tr>
<th>PROJECT SITES</th>
<th>FOREST TYPE</th>
<th>ESTIMATES FROM COMMUNITY MEASUREMENTS</th>
<th>ESTIMATES FROM PROFESSIONAL SURVEYS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mondulkiri Province, Cambodia</td>
<td>Deciduous forest</td>
<td>$75.5 \pm 19.6$ (SD) tC/ha for rectangular plots</td>
<td>$73.8 \pm 8.6$ (SE)tC/ha</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$72.2 \pm 23$ (SD) tC/ha for circular plot</td>
<td>(Vathana, 2010) Same forest patch</td>
</tr>
<tr>
<td>Yogyakarta &amp; Central Java Provinces, Indonesia</td>
<td>Home gardens</td>
<td>$34.2 \pm 20.6$ (SD) tC/ha</td>
<td>$35.3 \pm 21.2$ (SD) tC/ha</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(Roshetko, Delaney, Hairiah, &amp; Purnomosidhi, 2002) Different province</td>
</tr>
</tbody>
</table>

### MADANG PROVINCE, PNG

<table>
<thead>
<tr>
<th>PROJECT SITES</th>
<th>FOREST TYPE</th>
<th>ESTIMATES FROM COMMUNITY MEASUREMENTS</th>
<th>ESTIMATES FROM PROFESSIONAL SURVEYS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Madang Province, PNG</td>
<td>Mostly lowland and montane primary moist tropical forest (Hm class)</td>
<td>$127.7 \pm 40$ (SD)tC/ha</td>
<td>$106.3 \pm 22.7$ (SD)tC/ha</td>
</tr>
<tr>
<td></td>
<td>Biomass estimate for living trees with DBH &gt; 5 cm and lying deadwood (~7% of tree carbon pool)</td>
<td></td>
<td>(Fox et al., 2010) Same province and forest type Biomass estimate for living trees with DBH &gt; 10 cm</td>
</tr>
</tbody>
</table>

### KYOTO THINK GLOBAL ACT LOCAL PROJECT**

<table>
<thead>
<tr>
<th>PROJECT SITES</th>
<th>FOREST TYPE</th>
<th>ESTIMATES FROM COMMUNITY MEASUREMENTS</th>
<th>ESTIMATES FROM PROFESSIONAL SURVEYS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dhalli, India</td>
<td>Even aged Oak forest</td>
<td>$426.4 \pm 36.6$ (SE) tC/ha</td>
<td>$453.3 \pm 36.7$ (SE) tC/ha</td>
</tr>
<tr>
<td>Dhalli, India</td>
<td>Dense oak forest</td>
<td>$279.93 \pm 40.5$ (SE)tC/ha</td>
<td>$283.4 \pm 40$ (SE) tC/ha</td>
</tr>
<tr>
<td>Dhalli, India</td>
<td>Degraded oak</td>
<td>$38.1 \pm 3.7$ (SE) tC/ha</td>
<td>$41.7 \pm 4.6$ (SE) tC/ha</td>
</tr>
<tr>
<td>Kitulangalo, Tanzania</td>
<td>Savanna woodland (miombo)</td>
<td>$42.2 \pm 4.4$ (SE) tC/ha</td>
<td>$43.2 \pm 1.9$ (SE) tC/ha***</td>
</tr>
</tbody>
</table>

*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

• 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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