“Road to REDDiness – Making RELs Work”
Workshop Proceedings

Lowering Emissions in Asia’s Forests (LEAF)

Bangkok, August 23-25 2011
Summary

The following report provides a summary of the presentations and break-out discussions that took place during the ‘Road to REDDiness – Making RELs Work’ workshop, in Bangkok, August 23-25, 2011, funded by the United States Agency for International Development – Regional Development Missions for Asia (USAID-RDMA) and organized by the Lowering Emissions in Asia’s Forests (LEAF) Program. This report does not purport to provide all the information that was covered during the two and a half day workshop. However, coupled with the presentations from various specialists and the country representatives (available upon request to rattiya@leafasia.org), a good overview can be gained as to the issues discussed.

Fifty seven government officials and regional specialists attended the event, representing Lower Mekong countries (Thailand, Vietnam, Laos, Cambodia), as well as Malaysia and Papua New Guinea.

The LEAF workshop focused on the technical issues surrounding reference emissions levels (RELs), as well as the financial aspects of REDD+ and began exploring the best methods to develop regional collaboration. Robust and accurate RELs are a baseline from which countries will be able to monitor emissions reductions, and position themselves to potentially receive payments for these reductions under initiatives such as Reduced Emissions from Deforestation and Forest Degradation (REDD+). Participants shared their challenges and lessons learned through open discussions and a number of breakout sessions.

The workshop was successful on building on USAID and Winrock’s efforts to build REDD+ readiness in the Lower Mekong region as it resulted in practical recommendations on areas for regional collaboration. Over the next several years, LEAF will continue to engage regional governments, forestry and climate mitigation specialists and universities in a technical capacity building program focused on REDD+ Readiness.

LEAF would like to thank the workshop participants for sharing their knowledge and expertise as well as USAID-RDMA for its continuous support of this initiative. The LEAF team is excited to work together with all six countries to concretely lower emissions in Asia’s forests.

The following workshop proceedings follow the agenda of the workshop, with a synopsis of each presentation and key discussion points noted. For more information, please see the Annexes.
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Acronyms

AFOLU  Agriculture Forestry and Other Land Uses
ARBCP  Asia Regional Biodiversity and Conservation Program
ASEAN  Association of Southeast Asian Nations
BAU    Business As Usual
BEF    Biomass Expansion Factor
BSD    Benefit Distribution System
COP    Chief of Party
CSR    Corporate Social Responsibility
DME    Distance Measuring Equipment
EF     Emission Factors
EU     European Union
FAO    Food and Agriculture Organization
FCMS   Forest Carbon Monitoring System
FCPF   Forest Carbon Partnership Facility
FPIC   Free and Prior Informed Consent
GFC    Guyana Forestry Commission
GHG    Greenhouse Gases
GIZ    Deutsche Gesellschaft für Internationale Zusammenarbeit
GOFC-GOLD Global Observation of Forest and Land Cover Dynamics
IPCC   Intergovernmental Panel on Climate Change
ITTO   International Tropical Timber Organization
JICA   Japan International Cooperation Agency
MARs   Mutual Recognition Agreement
MRV    Monitoring Reporting and Verification
NKRA   National Key Results Area
NTFP   Non-Timber Forest Products
PNG    Papua New Guinea
Q&A    Question and Answer
R-PP   Readiness Preparation Proposal
SOP    Standard Operating Procedure
TNC    The Nature Conservancy
UNDP   United Nations Development Program
UNFCCC United Nations Framework Convention on Climate Change
VCS    Verified Carbon Standard
VOB    Volume Over Bark
WCS    Wildlife Conservation Society
WWF    World Wildlife Fund
Day One, August 23, 2011

This workshop spanned two and a half days. The focus of the first day was to introduce the LEAF program to the workshop participants and for the six countries to present their status on REDD+ as well as the challenges and lessons learned from their experience.

1. Introduction to LEAF

Ms. Carrie Thomson, USAID Regional Development Mission for Asia Acting Mission Director

In her welcoming remarks, Ms. Thomson touched on the importance of REDD+ in mitigating global climate change. She reiterated the United States’ pledge of one billion dollars at Copenhagen to support this effort. As announced by Secretary Clinton, LEAF (a five year, $20 million dollar program) is RDMA’s first major initiative in this effort and also serves to supports the US State Department’s Lower Mekong Initiative. The countries of PNG and Malaysia were also invited to join LEAF because of their important forest resources. USAID-RDMA expects that its support will also compliment the efforts of other development partners who are supporting the REDD+ programs in these six countries, such as the UN-REDD Program, the World Bank’s Forest Carbon Partnership Facility, the Asian Development Bank’s Greater Mekong Subregion program, and others. She acknowledged the expertise of Dr. Sandra Brown in leading this training event and explained that it will be followed by additional training opportunities and a learning-by-doing approach to enhance the technical skills that will be necessary to implement national and subnational REDD programs. She closed by thanking everyone for participating and for being strong environmental stewards.

Dr. Sandra Brown, Director and Chief Scientist for Winrock’s Ecosystem Services Unit

Dr. Brown opened the workshop by explaining the process used to determine the topic of focus - reference emission levels (RELs). Robust and accurate RELs are a baseline from which countries can measure emissions reductions, and position themselves to potentially receive payments for these reductions under initiatives such as Reducing Emissions from Deforestation and Forest Degradation (REDD+). RELs have been identified as a critical focus area in which countries need additional support. They are the starting point to any REDD+ mechanism as any measured emission reduction will be credited against a REL. She also noted that this Road to Readiness – Making RELs Work event builds on the Asia Regional Biodiversity and Climate Project’s (ARBCP) Strengthening National REDD+ Readiness through Regional Collaboration Workshop, held in Hanoi in May of 2010, which was also attended by many of the same representatives present during the this event. It is expected that this will be one of a series of similar events for which LEAF will work with country representatives to determine specific topics in areas of particular need.

She introduced the LEAF project and the agenda (included in Annex I) to participants, going over the technical aspects that will be presented and the outcomes expected from the breakout groups. These outcomes included:

1. Explore opportunities for regional cooperation;
2. Identify high priority needs the focus countries;
3. Develop an understanding of key technical issues; and
4. Discuss how LEAF can support the countries’ needs.

Dr. David Ganz, LEAF Chief of Party (COP)

Dr. Ganz provided a brief overview of the LEAF program and introduced its staff (Annex II). The LEAF program consists of six core countries (Thailand, Papua New Guinea (PNG), Lao PDR, Cambodia, Vietnam and
Malaysia) and six replication countries (Nepal, Bhutan, Indonesia, Philippines, India, and Bangladesh) where efforts developed under LEAF’s four objectives may be replicated. Dr. Ganz introduced the LEAF program as one that employs a regional approach to implementing program activities, clearly linking field activities to national and then regional levels. He provided three components to this regional approach which included: creating an overarching architecture that supports existing regional platforms and learning networks while coordinating shared learning opportunities; increased capacity of individual countries to implement the necessary reforms and programs to reduce emissions while increasing access to economic benefits; and carrying out site-specific field activities in target countries that will apply innovative tools and methods as a basis for scaling up and replication. He also went through the program’s four objectives as:

- Objective 1: Replicating Innovations: Replicate and scale-up innovation through regional platforms and partnerships
- Objective 2: Policy and Market Incentives
- Objective 3: Capacity building in which LEAF will develop decision support tools by partnering with regional universities and learning institutions
- Objective 4: Demonstrate innovation in sustainable land management through piloting strategic interventions.

After the program overview, Dr. Ganz explained that this workshop would focus on making RELs work in a national and regional context, but that LEAF belongs to the participating countries (for full list of participants view Annex II) and that it will remain very important to get feedback from them throughout the life of the program.

2. Setting the Scene – Country Presentations on REDD+ Status

**Dr. Sarah Walker**, AFOLU Climate Change Mitigation Specialist

In this introductory session of the workshop, Dr. Walker introduced the topics to be covered by a representative from each country. Each country was asked to provide an overview of the forestry and land use sector in their respective country and their progress in overall REDD+ readiness based on a template provided to them before the workshop. The topics covered were:

- State of Forests
- REDD+ Readiness Status/Overview of Roadmap
- Key Players in REDD+
- Major Funding Sources
- Progress on developing RELs and a MRV system
- Pilot Projects
- Challenges and Lessons Learned

The main points from the six 15-20 minute country presentations are summarized in table 1 below. Ten minutes of question and answer (Q&A) followed each of the presentations.

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1 For copies the presentations, please contact rattiya@leafasia.org.
### Table 1. Overview of country presentations

<table>
<thead>
<tr>
<th>Country - Presenter</th>
<th>State of Forests</th>
<th>REDD+ Status</th>
<th>Key Players</th>
<th>Major Funding Sources</th>
<th>REL/MRV Status</th>
<th>Pilot Projects</th>
<th>Challenges</th>
<th>Lessons Learned</th>
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<tbody>
<tr>
<td>PNG – Martin Barl and Joe Pokana, OCCD</td>
<td>Forest Cover is 29.4 M. ha covering 65% of the country. 83% of the population live in rural areas and are forest dependent</td>
<td>Although PNG is at the inception stage of REDD, it is a leader in the Rainforest Coalition of Countries and has been a key player in the Bali Road Map. R-PP to be submitted; Government of PNG[^2]; Eco-Forest Forum; WWF; TNC; WCS; New Britain Palm Oil; Forest Industries Association</td>
<td>Government of PNG[^2]; Government Budget; UN-REDD; JICA; AusAid; Delegation of the European Union; FCPF</td>
<td>REL is still being discussed between key stakeholders; Mandate to establish MRV system under OCCD 80% of UN-REDD funding to MRV.</td>
<td>Uni. of PNG Remote Sensing Center - Activity data; PNG Forest Research Institute - ground truth data; PINGFA/JICA Project - base map; UN-REDD - establishment of a National MRV System</td>
<td>Funding demonstration initiatives; Funding BSD study; Technical assistance</td>
<td>Integrated Government approach; Multi-stakeholder engagement; Leadership at the national and international level</td>
<td></td>
</tr>
<tr>
<td>LAO PDR – Mr. Vihn Phengdouang, Head of Division, Land Use Planning and Development</td>
<td>The Forest decreased to 9.8 million ha in 2002 from 11.2 million ha in 1992 with an average loss of 134,000 ha per annum = 0.6% of the total land area</td>
<td>R-PP accepted in 2010; REDD+ Task Force Established; Pilot country under Forest Investment Program</td>
<td>Government of Lao PDR[^3]; GIZ; KfW; WCS; WWF; SNV; Winrock International</td>
<td>Need guidance on REL; MRV based on provisions in the Cancun Agreement.</td>
<td>SUFORD; PAREDD; CliPAD[^4]</td>
<td>Leakage; GHG inventory for LULUCF; Nesting VCS into UNFCCC MRV; Geospatial capacity</td>
<td>Coordination is essential; Lack of human resources; Learning by doing through demonstration sites</td>
<td></td>
</tr>
</tbody>
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[^2]: Office of Climate Change & Development (OCCD) ; National Climate Change Committee (NCCC); PNG Forest Authority, Dept. of Agriculture, Dept. of Lands and Physical Planning, Dept. of Environment and Conservation, Dept. of National Planning and Monitoring, Forest Resource Institute, National Agriculture Research Institute.

[^3]: Department of Forestry (DoF); National Agriculture and Forestry Research Institute (NAFRI) and National Agriculture and Forestry Extensive Service (NAFES) all of which are part of the Ministry of Agriculture and Forestry (MAF).

[^4]: Sustainable Forestry and Rural Development Project (SUFORD); Participatory Land and Forest Management Project for Reducing Deforestation in Lao PDR; Climate Protection and Avoided Deforestation (CliPAD)
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</thead>
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<tr>
<td><strong>Thailand</strong> – Dr. Suchitra Changtragoon Department of National Park, Wildlife and Plant Conservation</td>
<td>Aim to increase forest cover from 30% in 2006 to 40% by 2020</td>
<td>Submitted R-PIN, Requesting the 200K formulation grant for their R-PP</td>
<td>Government of Thailand&lt;sup&gt;5&lt;/sup&gt;</td>
<td>FCPF</td>
<td>Need to develop proper RELs/RLs and baseline year for Thailand; Reforestation campaign in commemoration of Royal Jubilee project King and Queen Reforestation Initiative Project; 24 hour hotline to inform on illegal logging</td>
<td>Identify drivers; Land use conflicts; Understanding and participation of local communities and BDS; opportunity cost; MRV</td>
<td>Need to establish verification institute in relevant sectors, including forest sector, therefore capacity building for experts on verification should be developed</td>
<td></td>
</tr>
<tr>
<td><strong>Cambodia</strong> – Lao Sethaphal</td>
<td>Forest area 10 M ha or 59% of the country. Annual deforestation from 2002-2006: 0.5%</td>
<td>Cambodia has requested support from the UNDP as a delivery partner and had its R-PP assessed in March 2011.</td>
<td>National Climate Change Committee; REDD+ Taskforce; REDD+ Advisory Group; REDD+ Secretariat; Taskforce Secretariat</td>
<td>FCPF; UN-REDD; Government of Japan; JICA;</td>
<td>REL based on historical trend, national circumstance and under decision of UNFCCC</td>
<td>Oddar Meanchey Province;</td>
<td>Land conversion; Border conflicts; Unclear international trends for REDD+; Lack of market for REDD credits; Lack of funds for REDD project implementation</td>
<td>Support from high level of government is essential; Capacity building needed; Build trust among key stakeholders;</td>
</tr>
</tbody>
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<sup>5</sup> Ministry of Natural Resources and the environment (MONRE); Office of Natural Resources and Environmental Policy and Planning (ONEP); Thailand Greenhouse Gas Organization (TGO); Royal Forest Department (RFD); Department of National Parks (DNP); Forestry Industry Organization (FIO); Department of Marine and Coastal Resources (DMCR)
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</thead>
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<tr>
<td>Malaysia - Elizabeth Philip</td>
<td>Total forest area in dropped by 4% between 1990 and 2007 from 20.54 M ha to 19.66 M ha</td>
<td>Malaysia is at the inception stage of its national REDD+ strategy</td>
<td>Government of Malaysia; WWF and the Malaysia Nature Society</td>
<td>Government of Malaysia, UNDP, WWF and the EU</td>
<td>Harmonizing forest cover data; Deforestation rate low; Assessment of forest degradation on going; Assessment of carbon stocks/emissions through National Forest Inventory.</td>
<td>Voluntary Carbon Off Set Programme; Rehabilitation of degraded Peat Swamp Forest and enhancing connectivity between forest reserves; Communal forest (2013 onwards)</td>
<td>Harmonizing of methods/classification between departments; Harmonizing data sets; MRV</td>
<td>Capacity building for policy makers; A REDD Plus Strategy should be developed first; Improvement of procedures for pilot projects</td>
</tr>
<tr>
<td>Vietnam – Ms. Pham Minh Thoa</td>
<td>Forest cover decreased from 43% (14.3 M Ha) in 1943 to 27% in 1990 but increased to 39.5% (13.38 M. Ha) in 2010; Increase in timber volume of forest plantations could not compensate the loss of the natural forests. Deforestation is still severe in the Central Highlands and southern provinces</td>
<td>National REDD program started in early 2010. Discussion are ongoing, but National Climate Change Strategy has been approved and a BDS system for the whole country in being designed.</td>
<td>Government of Vietnam; SRD; CERDA; SNV; Winrock; ICRAF; CIFOR; FIP; FSIV; VFU etc.</td>
<td>UN-REDD; FCPF; Norad; EC; JICA; USAID; Finland; Germany; Australia</td>
<td>REL Based on historical national forest inventory data; Technically supported by JICA and Finland Embassy STWG-MRV was established; MRV Framework document is under development On 4th step of a 8-step consultation process</td>
<td>Mostly technical and public awareness raising; A small project for piloting payment at village level; Several pilot projects assisting on development of REDD+ projects</td>
<td>Development of allometric equations and biomass measurement at national and sub-national levels; A robust and transparent MRV &amp; M system; National REL</td>
<td>Systematic development and data management for MRV; Big investment needed for MRV MRV, and BDS should have close link and together form the core part of a comprehensive National REDD+ programme/strategy</td>
</tr>
</tbody>
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6 Ministry of Natural Resources and Environment (NRE), Department of Agriculture (DOA), Land & Survey Department, Ministry of Forest (MOF), Economic Planning Unit (EPU), State Planning Units, Ministry of Plantation Industries and Commodities (MoPlCo), Forestry Research Institute Malaysia (FRIM)
Summary of Q&A:

- PNG identified four components they considered for MRV under UN-REDD:
  - 1. Remote sensing;
  - 2. Ground truth data;
  - 3. Capacity building; and
  - 4. The need to establish proper system of governance so communities are involved from beginning to end and the importance of having consent from land owners (Free and Prior Informed Consent (FPIC)).

- Site selection criteria:
  - PNG mentioned that they are still developing criteria but they include:
    - 1. Livelihood opportunities;
    - 2. Limiting emissions; and how to limit logging;
    - 3. Benefits of REDD+ in the area; and
  - Vietnam has an ongoing World Bank study on opportunity cost in some forest areas, and believes the study needs to be continued to cover the whole forest system. They felt it was good starting point to choose pilot projects.

- Community monitoring for MRV:
  - PNG is working with civil society on this issue and upscaling the government approach to improve governance. Incentive to enforce monitoring is lacking at the moment. They want to empower communities to drive their own policies and have had success working with The Nature Conservancy (TNC).
  - Cambodia will establish an MRV team-member whose role will be to collaborate with Cambodia’s stakeholder’s at the sub-national level. Communities are interested in understanding how REDD+ can benefit them.
  - UN-REDD commented that it is important to be neutral when raising awareness about REDD+.

- Cost of establishing MRV. PNG estimated the cost of establishing MRV to take them to 2018 based on local circumstances, but it is only an estimate which may be adjusted. The major costs within this estimate include: remote sensing imagery to establish an inventory for the country as well as capacity building because there are 89 districts and PNG needs assistance at the local government level.

- Thailand is considering working on landscape management and looking to make it sustainable beyond protected areas. It would like to have more involvement on the local level.

- Drivers of deforestation/degradation.
  - Thailand identified illegal logging and forest area cleared for agriculture as the main drivers of deforestation and forest degradation.
  - Malaysia has a policy to no longer increase agricultural area but to increase yield through agricultural intensification.

- What policies is Cambodia using to enforce REDD+? Cambodia is using existing laws and applying them in this context.

- Sub-national strategies in all three parts of Malaysia will need to be aligned with the national strategy.

- When asked for examples of private funding that has been mobilized to support REDD+ efforts, the Malaysian delegation gave the example of Malaysia Airlines approaching them and providing funding for projects in order to offset their flights.

- When asked how they developed their emission factors, Vietnam explained that they followed FAO methods and IPCC guidelines.
• LAO PDR was asked why they used the VCS (Verified Carbon Standard) REDD+ methodologies over others. They responded that although they used the VCS, discussions are ongoing as to which methodologies are most appropriate.

3. Breakout Discussion Groups - Shared Issues and Lessons Learned

At this stage of Day One of the workshop, participants were broken up into three breakout groups based on their technical expertise to discuss shared issues and lessons learned on the following topics: a. REDD+ Strategy Development; b. REL and MRV Creation; and c. Pilot/Demonstration Project Development.

3.1 REDD+ Strategy Development

- **Top priorities.** i. Forest policy reform to integrate REDD+; ii. Institutionalization of benefit distribution system (BDS) and iii. Interagency Cooperation.
- **Obstacles.** i. Land tenure and ownership is not always clear; ii. Institutional structure for BDS is not clear, nor is how BDS can be embedded into a national system; iii. Overlap of responsibilities and no clear mandate of ministries for REDD+; and iv. Competition with other land uses. In addition, the cost/benefit for REDD+ is not understood so there is not as high of an emphasis on REDD+.
- **Recommendations.** i. Economic assessment of REDD+ investments from a policy makers perspective to support decision making; ii. Have integrated strategy, especially for Mekong countries; iii. Sharing of information, especially for REL development; iv. REDD+ need to be integrated into National plans; v. Establish clear mandate for each of the ministries as different aspects of REDD+ would fall under different ministries; vi. REDD+ competes with other land use and REDD+ will not always be the priority; vii. Important to have pilot projects to link REDD+ to livelihood; viii. Importance of thinking about long term investment and save resources for future generations; ix. Hard to share information on benefit sharing when countries have different view of land ownership, but MRV can be shared because similar forests across the region.
- **Integrate REDD+ into national plan.** REDD+ also relates to social and environmental safe guards so it has to go beyond climate change strategies to a master national plan.

3.2 REL and MRV Creation

- **Top priorities.** i. Converting activity data to biomass calculation; ii. Developing allometric equations for each country; iii. Capacity building on nesting between subnational and national scales.
- **Obstacles.** i. Historical data collection is a big issue because quality and quantity of this information is lacking. There is a gap of data over certain time periods; ii. Converting data that was collected for different purposes to data that can be used for REDD+; iii. Standardizing data is a big issue, especially for Malaysia, as is finding a clear definition for forests. For instance, can plantations such as rubber and palm oil be included in REDD+?
- **Recommendations i.** Scientists need to have strong support from policy makers to harmonize and processes and data; ii. Mutual Recognition Agreement (MARs) between the Association of Southeast Asian Nations (ASEAN) countries could be a useful program

3.3 Pilot/Demonstration Project Development

- **Top priorities.** i. Land tenure; ii. Funding; iii. Political support.
- **Obstacles.** i. Land tenure is the big challenge because in some countries forest demarcation is outlined on the map but local people don’t know who the land belongs to, so they conduct business as usual on it; ii. No one is sure about the market for REDD+, and if you get money how is it distributed; iii. If there is no
funding for the project in the first place it will be hard to move the project forward; iv. Political support is important as well at the local level. A project cannot run smoothly without local government support.

- **Recommendations.** i. In PNG, no one knows who the land belongs to but the pilot project actually helps them find out, which is a co-benefit to the pilot project. ii. Communities have high expectations, so it is important to temper expectations and clearly explain the steps needed to secure the money in a method that is adapted to each community.

**Summary of Q&A:**

- Should adaptation be included in REDD+ strategy or vice versa? Under the United Nations Framework Convention on Climate Change (UNFCCC) negotiations they are separate issues however there is clear overlap and synergies between REDD+ and adaptation such as in the case of mangroves.
- Talk about “co-benefits” in REDD+ such as poverty alleviation. Adaptation is another type of co-benefit. Also, adaptation costs should be included in opportunity costs when conducting economic analysis.

4. **Summary of Day One**

**Dr. Brown** provided a brief summary of the day. She identified that one common theme is conveying REDD+ to local communities. She explained that it takes people with expertise in communications to convey to local communities what REDD+ is and what benefits it may provide. She encouraged participants to consider alternative delivery methods, such as podcasts, climate change messages in soap operas, or even children plays, to more successfully reach out to diverse stakeholder groups and different age groups.
Day Two, August 24, 2011

Day two covered the key role played by RELs in the financial architecture of REDD+, the technical aspects of establishing a REL, how to project historic emissions, a case study on this issue and tools that the LEAF countries can use when working on their RELs.

5. Financial Architecture - Results Based Finance under REDD+

Ms. Anna Lehmann, LEAF Policy Advisor

Ms. Lehman provided an overview of what REL are, what they are used for, what sources of finance may be available for REDD+, what will be funded, and how that might happen (public vs. private). She explained that government has a mosaic of measures available to manage emissions, such as policy and regulatory measures as well as introduction of market incentives and technology change and that all these measures could form part of a national REDD+ scheme.

The question for establishing a REL is what would be new measures under REDD+? She touched on the three phases of REDD+ financing:

- Phase 1: National REDD+ strategy development;
- Phase 2: Implementation of REDD+ actions supported on the basis of needs by donor agencies; and
- Phase 3: Implementation of REDD+ actions incentivized on the basis of MRV’ed greenhouse gases (GHG) emissions/removals against agreed reference.

She concluded by explaining that REL development is a process – there are different types of RELs and they can interact with other sectors. RELs need to be part of national emission reduction planning (National Low Carbon Development Strategies) and are needed to measure results to unlock funding. In advanced state RELs could serve as a potential tool to manage sovereign forest carbon assets.

Summary of Q&A:

- A representative from UN-REDD commented that REDD+ will be a compliance mechanism when countries enter phase 3. The magnitude of the funding will be a negotiating question, but there will be a major compliance financing market. He added that a project based approach for REDD+ will not be enough for it to work.
- Ms. Lehmann responded that projects can drive support and start investment into the MRV structure. It is knowledge that governments can use and apply at the national level when they scale up. Dr. Brown added that we have learned a great deal over the past few years from projects that has fed into methodical development.
- In Vietnam, there are efforts to create a pseudo-REDD+ fund for them to start making performance-based payments. Vietnam is moving into phase two, and co-financing has proven very difficult under tier one. However they do not know what the results are under the more flexible tier two.⁷

6. Historic Emission Estimation within REL

Dr. Sandra Brown. Dr. Brown covered five points on this topic through three presentations. The main points were:

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⁷ Tier one and tier two are UN-REDD terms. Tier one requires all contributors to put money into one trust fund. Tier two is a more flexible mechanism to finance REDD+.
1. How to establish RELs and why they matter;
2. Assessment of existing data and collection of new data: Activity data and emission factors;
3. Developing simple models to arrive at emission factors--allometric equations and root shoot ratios.
4. Approaches for incorporating national circumstances to determine future emissions scenarios.
5. Guyana as a case study for a country in advanced stages.

6.1 Establishing Reference Levels: Importance and Approaches
Dr. Brown began by explaining that the difference between a reference emissions level (REL) and a reference level (RL) is that the RL incorporate the plus in REDD+ where as a REL is only focused on the emissions. The UNFCCC are still developing modalities to establish RL and a report from the Meridian Institute (of which Dr. Brown is an author) is providing input to this process. Whether its REL or RL, reference levels are important to help establish a business as usual (BAU) baseline against which performance can be measured. Historic emissions indicate where emissions are happening and what the causes are. With this knowledge strategies can be developed to reduce emissions. Also, the information used to establish a RL is what is needed for MRV. IPCC methodologies to calculate emissions based on activity data and emissions factors have been approved and peer reviewed. However existing data in many countries are limited. To build their data, a country can start at the sub-national level because the steps are going to be the same for the national scale. Countries can also select which activities they choose to include based on the data available. A variety of remote sensing data are available (e.g. Landsat and SPOT), but the resolution needed and costs vary depending on the activity. For small scale clearing higher resolution and more ground truthing may be necessary, so measuring degradation may be more challenging than deforestation. However, it could reap great rewards for those countries able to establish a monitoring and accounting system. What activities to include remains a sovereign decision.

6.2 Reference Levels: Approaches for Projecting Historic Emissions
Emission factors (EF) and activity data are needed to establish RL. There are two ways to generate EF: the stock change approach, which is best for measuring deforestation and afforestation and the gain loss approach, which can be used for forest degradation. For either approach, it is important to identify the data that can be used and data gaps that need to be filled. Data must represent forest of interest and meet accuracy and precision standards. If it is older than about 10 years, it may be of limited value. Data from available forest inventories can be adapted to calculate biomass by “expanding” volume over bark (VOB) of merchantable growing stock and by using relevant biomass expansion factors (BEF). Alternatively biomass is estimated using allometric equations. There are many existing regression equations. However, taking wood density into account, the architecture of most trees is similar, so existing equations may be used for national circumstances. To do so, data need to be collected through destructive sampling and compared against existing allometric equation that match the targeted area and whose maximum diameter does not exceed the maximum diameter of the trees sampled. Dr. Brown concluded by explaining that it is much more cost-effective to verify against existing equations than to develop new allometric equations.

6.3 Reference Level Creation - Guyana as a Case Study
To provide an example of a successful national effort to create RELs, Dr. Brown talked about Winrock’s experience in Guyana. Guyana is in the process of developing its REL and MRV systems. Winrock is working with Guyana’s Forestry Commission (GFC) to develop their Forest Carbon Monitoring System (FCMS) in two phases: 1. Designing the FCMC; 2. Implementation. The goal is to develop a national look up table by strata and EF. The key first step was to determine how to stratify the forest and by what criteria. In this case, it was stratified by carbon. Winrock selected and processed factors contributing to the deforestation and conducted a standard spatial analysis to develop spatial factors maps. The end result was carbon
stratification map, which was used to develop a sampling design. After one year, two field trainings for GFC staff have been completed, including biomass carbon plots (trees, dead wood and soil) and logging plots; above and below ground trees and dead wood pools have been selected for the FCMS; soil carbon pool will be included for those lands converted to permanent agriculture, while mining is still being discussed; preliminary field data have been collected and are being analyzed to estimate the number of plots needed; data for emission factors for logging are being analyzed with over 100 logging gaps having been measured; a method for estimating regrowth in gaps after logging are being tested (chronosequence of logging gaps); and the sampling design and implementation plan are being finalized and implemented this year. Ongoing challenges include the quantity of forest degradation and establishing methods to model the carbon impact of shifting cultivation. The successes to date can be attributed to significant financial incentives, a clear mandate for the REDD+ implementing agencies as well as cooperation and transparency among all relevant ministries and agencies.

Summary of Q&A:

- **Biomass.**
  - Why is it important to sample larger trees? The biomass in large trees varies much more than smaller trees because of their age, so when conducting a regression analysis it is useful to sample a larger number of trees (i.e.: more than five).
  - Is there an allometric equation for mangroves? Mangroves vary a lot around the world, so it is very difficult to develop generic equations for all mangroves.
  - How is biomass per tree obtained? Biomass is calculated through field work. You harvest trees, weigh the above ground, extract the root, dry and weigh them.

- **Concerning biomass plot data, a comment was made that the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) currently has three VCS projects in Laos and they have teamed up with the Japan International Cooperation Agency (JICA) to have data on plots that will be available for everyone.**

- **Sampling strategy.**
  - Looking at the Guyana case study, Dr. Brown’s team had several days of discussions with Guyana to determine the right steps. Guyana hired field staff and identified existing staff that could be the leads. It has been an iterative process. There has been no community engagement because in forest areas under most threat for change there is very little population. The Amerindian communities (Guyana’s indigenous community) have not decided whether to join national efforts.
  - What was the estimated cost for Guyana to develop their REL? Winrock’s efforts for the sampling strategy cost less than $400,000 and the cost for the remote sensing group was on the same order. An estimate for the total cost of the sampling strategy is of the order of one million US dollars.
  - How is measurement error minimized in the field? Measurement error is minimized through having standard operating procedures incorporated into the QA/QC plan and to make sure checks of field measurements are done in the field.
  - What is the cost of permanent plots? The cost of permanent plots depends on accessibility and cost of living in that country.

- **How do you determine community involvement in monitoring?** Need to identify what level communities may be able to contribute and you can develop standard operating procedures. One option could be to employ evolving technologies such as smartphones.
7. Tool Overview - LEAF Technical Assistance Examples of Tools

**Dr. Sarah Walker.** Dr. Walker provided an overview of some technical tools and manuals useful for REDD+. She touched on the USAID Reporting tool that allows all USAID forestry projects to report GHG emission reductions by providing minimal information. The future version will include a carbon project planning tool. She referred to existing resources that can provide support for REDD+ such as the Global Observation of Forest and Land Cover Dynamics (GOFC-GOLD) REDD Sourcebook and the International Tropical Timber Organization (ITTO) Guidebook for the Formulation of Afforestation and Reforestation Projects under the CDM. She then elaborated on Winrock’s Carbon Toolkit which consist of the Terrestrial Carbon Measurement Standard Operating Procedures (SOP), a plot calculator tool, a carbon stock calculator tool and logging emission factor tool and a destructive sampling tool. She provided more detail on the Carbon Stock Calculator Tool and the Logging Tool. For the Carbon Stock Calculator Tool, a user can enter plot data from various carbon pools (e.g. above ground tree biomass, lying dead wood etc.) to automatically calculate the biomass and consequently the carbon for each plot. The different data needed for each pool and the method to gather them is explained in the SOP. The logging tool enables a user to calculate the loss of biomass and therefore the carbon emissions from the logged trees, the incidental damage it caused (e.g. other trees killed) and the land use cleared for the infrastructure (e.g. roads and skids trains) used to transport it.

**Summary of Q&A:**

- Does the Winrock Carbon Stock Calculator incorporate wood density? In the new version naming the species will automatically indicate what the wood density is. LEAF will work to customize this tool for the region.
- Why does Winrock use circular plots to measure biomass as their SOP? Winrock has found that circular plots are more efficient and the error level is lower. Part of this is because there is error in the diagonals in square plots. Winrock also use the Distance Measuring Equipment (DME) in the field and nested plots so not waste time measuring on all the small trees. This method even works on slopes.

8. Reference Levels: Approaches for Adjusting for National Circumstances

**Dr. Sandra Brown.** Dr. Brown’s final presentation of Day Two focused on projecting and modeling future emissions from land use to adapt ever-evolving national land use scenarios. Certain factors such as planned deforestation are known and must be taken into consideration. For unplanned deforestation and degradation there are methods to project where these may happen and at what magnitude. Threat assessment modeling helps locate where future deforestation may happen and historical evidence helps to understand critical factors of deforestation. New automated software packages such as IDRISI can estimate deforestation automatically given the data inputs and can help identify and assess potential hotspots for REDD+ intervention. She concluded by reminding the workshop that modeling deforestation is not a prediction of the future (the future cannot be known), but simply a tool to “project” a potential scenario given a specific set of assumptions.

**Summary of Q&A:**

- Clarification about IDRISI. IDRISI is releasing a new model that will be specific for REDD+. It will be launched in Durban.
- Expand on usefulness of spatial modeling. Spatial analysis indicates what trends may help countries think about where they are going to have success and how.
- When asked about the status of current IPCC methodologies, Dr. Brown clarified that there are no plans to update current IPCC methodologies, but they are doing the 5th assessment report now.
On the question of when baseline projections should be revised, Dr Brown explained that depending on the country, baseline projections may be revised every 5 years but no internationally agreed on time period exists yet (still up for debate though several key developed countries pushing for reviewing them every 5 yr), especially in developing world where change in land use can be quite fast. Once they are operational it becomes simpler.


At this point of Day Two, the representatives broke out into six breakout groups by country to discuss what national circumstances need to be considered to reach projections over a 10 year period.

9.1 Malaysia
- Drivers of deforestation. i. Agriculture expansion; ii Settlements; iii Infrastructure development; iv. Mining (very minor).
- Drivers of degradation. i. Forest fragmentation; ii. Harvest of non-timber forest products; iii. Encroachment; iv. Slash and burn agriculture (very minor); v. Logging; vi. Mining; vii. Forest fire, only in Sabah (2000 ha out of 40M ha)
- National circumstances to consider for the reference level (RL). i. Review of NKRA (National Key Results Area); ii. National Agriculture Policy (Draft); iii. Renewable energy policy; iv. Energy efficiency policy; v. National action plan solid waste management; vi. 40% carbon intensity reduction by 2020 from 2005 levels; vii. Maintain at least 50% forest cover. viii. Land development for projected population increase (population increase to 32 M by 2020 that is a 4 M increase from today with 2 M illegal immigration); ix. Regional migration patterns; x. 4.5 - 5% increase GDP target.

9.2 Cambodia
- Forest degradation. i. Unsustainable logging; ii. Forest fire in dry season; iii. Unsustainable non-timber forest product (NTFP) collection.
- National circumstances to consider for the reference level (RL). i. Mining concessions; ii. Social land concessions; iii. New roads; iv. Electricity transmission; v. There are no more logging concessions; vi. The waste of illegal logging is not enough to fill charcoal demand.

9.3 Lao PDR
- Drivers of deforestation and degradation. i. New road and infrastructure; ii. Land linkage policy, link Lao PDR to other countries to help stimulate investment; iii. Population increase and resulting shifting cultivation; iv. Foreign donor investment in agroindustry (rubber, sugar cane plantations); v. Increased hydropower; vi. Mining; Increased uncontrolled and illegal logging and wood extraction. Vii. Forest cover changes 0.8% per year and is at 41% right now
- National circumstances to consider for the reference level (RL). i. Aim to increase forest cover to 70% by 2020; ii. Increase forest law enforcement; iii. Forest resource strategy 2020; iv. Urbanization, Lao PDR is 80% rural; v. Policies to stabilize land use planning; vi. Land-use intensification; vii. Goals of Ninth Party Congress: Administration and governance, Capacity building, Ensure poverty deduction.

9.4 Vietnam
- Drivers of deforestation and degradation.
Root causes. i. Poverty; ii. Population growth; iii. Food demand; iv. Economic development; v. Law enforcement;

Proximate causes. i. Forest fire; ii. Harvesting technique; iii. Shifting cultivation; iv. Mining; v. Infrastructure; vi. Illegal logging; vii. Limited capacity

National circumstances to consider for the reference level (RL).

Future. Increase national forest cover to 43% by 2050

Parameters to address drivers. i. Policy; ii. Complete land allocation; iii. Comprehensive integrated land-use planning; iv. Ensure consistent policy; v. Technology; vi. Improve harvesting technique; vii. Training capacity for forest owners; viii. Improve forest inventory; ix. Increase agriculture productivity; x. Use effective tool for planning technique.

Social and Economic. i. Livelihood improvement, provide alternatives at local level; ii. Awareness raising; iii. Consultation strategy and implementation

9.5 Thailand

Drivers of deforestation and degradation. i. Infrastructure; ii. Agriculture expansion; iii. Tourism (North and South); iv. Demand for illegal timber; v. Need for land reform; vi. Land tenure issues; vii. Weak law enforcement; viii. Mining; ix. Increasing access to undisturbed forest land due to natural disaster; x. Shifting cultivation; xi. Population growth; xii. More frequent and intense natural disturbance such as flood, storm, rain, fire in the North, floods and droughts in the North East.

National circumstances to consider for the reference level (RL). i. Policy change; ii. Land zoning; iii. Economic development; iv. Education and public awareness; v. Community participation; vi. Investment from abroad (CSR); vii. Law enforcement; viii. Social development; ix. Poverty; x. Birth rate

9.6 PNG

Drivers outside the forestry sector. i. Mining and petroleum - 18 mining sites 54,000 ha and 10 potential locations covering 30,000 ha; ii. Commercial agriculture (1 M ha) and 5 M ha being approved iii. Subsistence agriculture; iv. Infrastructure development; v. Need for rural electrification.

Drivers inside forestry sector. i. Conventional logging; ii. Encroachment; iii. Subsistence agriculture.

National circumstances to consider for the reference level (RL). i. Need to harmonize land use plan between ministries; ii. Harmonize policy within each department; iii. PNG has launched reforestation plan, 20% away from this year’s goal

10. Summary of Day Two

Dr. David Ganz. Dr. Ganz summarized the common themes from the breakout groups and discussions throughout the day and the lessons learned from all six countries. A key theme was that REDD+ needed to serve as a tool for poverty alleviation and compliment economic development. Most countries have climate change goals through land use policy and renewable energy targets, but these goals need to be harmonized across sectors. Countries talked about the drivers of degradation and deforestation namely: demographic changes, new road developments and mining concession as well as the increasing occurrence of natural disasters related to climate change. The main lessons learned are that there needs to be good financial incentives, a mandate from financing agencies and that cooperation and transparency are essential as is strong leadership.
Day Three, August 25, 2011

In day three, countries listened and discussed what various demonstration project site selection parameters may be, how sub-national interventions may fit into a national REDD+ mechanisms through nesting and the conversation was opened to what platforms would be most appropriate for countries to share knowledge and lessons learned in order to move forward together on REDD+.

11. Selecting Pilot Site Interventions

Mr. Richard McNally, LEAF Forest and Climate Change Advisor

One of the main objectives [objective 4] of the LEAF project is to introduce innovative demonstration activities in the pilot countries. Mr. McNally presented on the criteria necessary to select a pilot site and outlined the process taken to determine pilot interventions under LEAF. Criteria included: the best opportunities for emissions reductions, lower opportunity costs, an opportunity for improved forest management, accessibility to the site, choosing a representative eco-region and the opportunity for poverty alleviation. He then opened up the topic to be discussed into breakout groups. More specifically the breakout groups discussed site selection criteria and priority interventions.

12. Breakout Discussion Groups - Identifying pilot project activities

For this Day Three breakout session, countries were paired up to form three distinct groups to discuss their views on the key steps in identifying pilot site interventions. Each group focused on the criteria necessary to select an area and on the process by which to prioritize pilot project activities. Several of these breakout groups also focused on subnational interventions and the technical support needed to advance and harmonize these pilots within the developing national frameworks.

12.1 PNG and Thailand

- Site selection criteria. i. International mandate; ii. National mandate; iii. Biological characteristic; iv. Social and economic policy; v. Stakeholder; vi. Ecosystem Services (e.g. carbon, water, biodiversity); vii. Recreation (e.g. national parks, ecotourism); viii. Financial institution support; ix. Private sector; x. Mining companies; xi. Energy companies; xii. Opportunity for economic and social benefit; xiii. Work with many governments and stakeholders; xii. Agroforestry opportunities

- There is top down guidance from national and international mandates. It is important to work with partners from the financial and other sectors.

12.2 Laos and Vietnam.

- Site selection criteria. i. Local capacity and willingness; ii. REDD+ activities (e.g. UN-REDD Vietnam); iii. Area of high poverty (improve livelihood); iv. Need scientific backing to make politically sound decision; v. Focus on national protected areas; vi. Accessibility; vii. Co-financing

- Where is support needed? i. Provincial strategy for REDD+ support, support the offices at the provincial level (e.g. in Lao PDR there will be a government office in every province dedicated to REDD); ii. Testing VCS projects outside of protected areas; iii. Improve livelihood; iv. Raising awareness; v. Improve forest management; vi. Support forest enterprise to carbon market; vii. Land use planning
12.3 **Malaysia and Cambodia.**

- *Site selection criteria.*
  i. Forest land security; ii. Credit potential from REDD; iii. Easy to access; iv. Improve livelihoods; v. Support by local community;

- Subnational Interventions.
  i. Funding; ii. Awareness raising; iii. Law enforcement; iv. Clear benefit sharing procedures; v. Monitoring and evaluation system in place at the ground level

13. **National vs. Sub-national RELs – Coexistence & Consistency**

**Mr. Robert O’ Sullivan, Executive Director, Climate Focus America, and Dr. Sarah Walker**

Mr. O’Sullivan and Dr. Walker presented on linking or ‘nesting’ national strategies with subnational implementation. After providing some background information on the thinking behind this approach and explaining the principle, they touched on institutional issues that need to be addressed and how nesting fits into the UNFCCC phased approach. They concluded by explaining how subnational projects can be beneficial in the national context (e.g. creating land cover maps for region of country, contributing to carbon stock measurements and emission factor creation, verifying allometric and biomass expansion factor (BEF) equations).

14. **Regional Cooperation – The REDD desk**

**Dr. Sandra Brown.** One of the objectives of the LEAF program is to share information across the region through platforms. Dr. Brown provided an example of a potential platform that LEAF could use to share knowledge in the region called the REDD Desk, which had been developed by the Global Canopy Programme. This is just one platform that LEAF is exploring in order to share information and lessons learned throughout the region. Cambodia has already worked with the REDD Desk to develop their own password-protected resource for internal information sharing.

**Summary of Q&A:**

- Given the rapid proliferation of information sharing resources on REDD+ in the region, LEAF’s focus will be on strengthening existing platforms.
- Comment. Would be useful to share good practice from pilot sites from the region and form other places in the world and to pick up unresolved items from other technical workshops. There are many workshops on the same thing from many different organizations. How can we limit the number of workshops so not to waste resources going to the same thing in different places?
- Strategy to facilitate decision making. LEAF will work among existing structures such as ASEAN and the REDD+ partnership. It is looking at rapid assessments for each countries then intervention in individual countries

15. **Next Steps**

**Dr. David Ganz.** Before wrapping up the workshop Dr. Ganz shared next steps in areas where LEAF may be able to provide support to build on the workshop. These included:

- Identifying mechanisms for sharing data among the six countries for developing regional allometric equations. In the short term, LEAF can work on the allometric issue, identify what data exist, what standards do data need to meet, what data need to be collected, and what statistical methods and models should be used to develop the equations.
- Explore options to identify donors.
- Harmonize efforts at the regional level.
• Provide short courses in country on technical issues that build upon each other into an accounting module for a country to move towards readiness.
• Webinars and Podcasts
• LEAF is identifying knowledge centers with the Asia Forestry Dean Network to put climate change on the agenda for forestry and natural resource professionals.
• LEAF will likely hold a workshop for policy makers at the regional level.
• Policy briefs are very useful tool for policy makers. LEAF can certainly provide a communication workshop on how to write policy briefs. Malaysia has identified communication as the bridge to communicate with policy makers as well as implementers.
• LEAF can provide advice on different policy advice that a government can consider.
• Need to work with universities to identify what are the costs associated with MRV and REL and how to move REDD forward from a practical sense. LEAF can establish a series of short courses on several of these technical inputs in conjunction with these universities and knowledge centers.

Dr. Ganz then thanked everyone for their participation and those that travelled from far. He emphasized that the theme was on road to readiness here, but we have many more objectives and LEAF will have other regional workshops to address those needs.

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8 There is an example of a policy brief from UNEP on the role of forest in the green economy.
# Annex I – Workshop Agenda

## “Road to REDDiness – Making RELs Work”
**August 23-25, 2011**

**Venue:** Courtyard by Marriott Bangkok  
155/1 Soi Mahadlekluang 1  
Rajdamri Road, Pathumwan  
Bangkok 10330, Thailand

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<th>DAY ONE</th>
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<tr>
<td><strong>Time</strong></td>
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<td>08:00 – 08:45</td>
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<td>08:45 – 09:15</td>
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<tr>
<td><strong>I. Introducing LEAF</strong></td>
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<td>09:15 – 09:30</td>
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<td>09:30– 10:00</td>
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<td><strong>II. Setting the scene</strong></td>
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<td>10:30 – 11:00</td>
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<td><strong>III. Country Presentations on REDD+ Status</strong></td>
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<td><strong>Country Presentations, continued</strong></td>
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<td><strong>IV. Shared issues and lessons learned</strong></td>
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<td>15:45 – 17:15</td>
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<td>18:00 – 20:00</td>
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| 8:30 – 9:15| RELs in context of UNFCCC and bilateral schemes | • Linking RELs to results based finance, connections with private sector  
• Institutional requirements & Funding options | Anna Lehmann             |
| 9:15 – 9:45| Importance of RELs in REDD+ strategy design and implementation | Defining context of day’s presentations and objectives               | Sandra Brown             |
| 9:45-10:30 | Standards and Methods                     | • Agents/causes of land cover change  
• Estimating deforestation rates,  
• Estimating forest degradation rates  
• Estimating changes in canopy cover  | Sandra Brown             |
| 10:30– 10:45|                                            |                                                                      |                          |
| 10:45– 12:00| Standards and Methods                     | • Forest definitions and choice of thresholds  
• Type and use of existing data for C stock estimation  
• Developing carbon stratification | Sandra Brown             |
| 12:00– 13:30|                                            |                                                                      |                          |
| 13:30– 14:15| Tool Overview                            | • Carbon Stock Tool  
• Logging Tool                                                             | Sarah Walker and Alex Grais |
| 14:15-15:00| Country Experiences in Creating RELs    | Analytical approaches to threat assessment                            | Sandra Brown             |
| 15:00 - 15:30| Country Experiences in Creating RELs | What are national circumstances that need to be considered?            | David Ganz/Breakout sessions |
| 15:30 – 16:00|                                            |                                                                      |                          |
| 16:00 – 17:00| Country Experiences in Creating RELs | What are national circumstances that need to be considered? Break-out presentations | David Ganz               |
| 17:00 – 17:30| Summary of the day/Wrap Up            |                                                                      | David Ganz               |
# DAY THREE

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<tr>
<th>Time</th>
<th>Agenda item</th>
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<tr>
<td><strong>I. Piloting Interventions</strong></td>
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<td>8:30 - 9:00</td>
<td>Identifying Pilot Interventions</td>
<td>• Goals of pilot interventions?</td>
<td>Richard McNally</td>
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<td>• What makes a good pilot intervention?</td>
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<td>9:00 – 10:00</td>
<td>Identifying pilot activities and locations</td>
<td>What are key factors to consider?</td>
<td>Breakout session</td>
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<td>10:00 – 10:15</td>
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<td><strong>Coffee break</strong></td>
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<td><strong>II. National vs Sub-national RELs – coexistence &amp; consistency</strong></td>
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<td>10:15 – 11:30</td>
<td>Linking or nesting national strategies with subnational implementation</td>
<td>• Current thinking on nesting approaches</td>
<td>Robert O’Sullivan and Sarah Walker</td>
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<td>• Types of coordination between projects and national levels</td>
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<td><strong>III. Regional Cooperation, Next Steps</strong></td>
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<td>11:30 – 12:15</td>
<td>Discussion on potential regional cooperation, information sharing and institutional development</td>
<td>Cooperation on capacity building, etc</td>
<td>Open discussion</td>
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<td><strong>IV. Wrap Up</strong></td>
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<td>12:15 -12:30</td>
<td>Next Steps under LEAF</td>
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<td>David Ganz and Sandra Brown</td>
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<td>12:30 -12:45</td>
<td>Wrap Up</td>
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<td>David Ganz</td>
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<td>12:45 – 13:30</td>
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<td><strong>Lunch</strong></td>
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## Annex II – Participant’s List

### Road to REDDines – Making RELs Work

**Participant Contact List**

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<thead>
<tr>
<th>Name</th>
<th>Country/Affiliation</th>
<th>Contact Information</th>
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<tbody>
<tr>
<td>Mr. Kamnap Phan</td>
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<td>Mr. Vathana Khun</td>
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