FRLs development

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WHY WE HAVE TO ESTABLISH THE FRLS?

Requirements of UNFCCC

1. Decision 1. P paragraph 71 item c COP16

- **Require**: A national forest reference emission level and/or forest reference level, if appropriate, as an interim measure, subnational forest reference emission levels and/or forest reference levels, in accordance with national circumstances, and with provisions contained in decision 4/CP.15, and with any further elaboration of those provisions adopted by the Conference of the Parties;

Decision 12/CP.17
WHY WE HAVE TO ESTABLISH THE FRLS at Provincial Level?

2. Decision 799 approved by VN Prime Minister

KEY TASKS to 2015: Setting up the temporary RELs/FRLs at the national level and in the pilot provinces taking consideration to the specific conditions of Vietnam, the provisions of the UNFCCC and the financial and technical support provided by the international community.
WHY WE HAVE TO ESTABLISH THE FRLS?

3. Support to the PRAP answers the question of Potential emission reduction How many CO2e? and Where?

4. Support to national level to allocate the revenue of REDD+ (RLs works at Watershed of PFES)

5. Integrate to national level.
Update from SBSTA 38th, 13 June 2013
“SBSTA 38 also agreed to continue its work on guidance for the technical assessment of the proposed forest reference emission levels and/or forest reference levels, as requested in decision 12/CP.17, paragraph 15, on the basis of the elements contained in document FCCC/SBSTA/2013/3/Add.2, with the aim of completing that work and preparing any recommendations for a draft decision on the matter for consideration and adoption at COP 19”
Should we wait for the guidance of SBSTA?

- No detail guidance so far and may be in the future also
- Parties have to submit the Proposals on RLs
- We have to do by ourselves
THE MODALITY TO DEVELOP RLs AT A GLANCE
Reference level Decisions Tool

1. Determine Scope of Activities
2. Finalize Forest Definition
3. Determine Scale (National or Summed Subnational)
4. Determine Which Pools/Gases to Include
5. Link REDD+ to a National Forest Inventory?
6. Adjust for National Circumstances?
7. Should a Location Analysis Be Included?
Activity Data

- Rates of Deforestation
- Rates of Tree Planting
- Rates of Degradation by Activity Type

Emission/Removal Factors

- Emission Factors for Deforestation
- Removal Factors for C stock enhancement
- Emission Factors for Forest Degradation

Historic Emissions Estimate for REDD+

Historic Emissions Estimate by REDD+ Activity

Emissions Estimate Projected into Future / Adjusted for National Circumstances
RLs

Net emission per year

Historical

Future

BAU

RLs that take into account the national circumstances

Starting point of REDD+ Mechanism

Time

Historical

Future
Three main steps of Establishing FRLs

1. Establish Historical Reference
2. Projection of BAU line (Business as usual line)
3. Extrapolate the RLs (take in to account the policies issues, and national circumstances)
Establish Historical Reference Levels

1. FCCA to for AD (at least 10 years)
2. NIF analysis for EF
3. Establish Historical emission Level
Projection of BAU line (Business as usual line)
Methodology of Projection of BAU

1. Mathematical models
2. Econometric modelling
3. Dynamic land use modelling
4. Others (Average Etc.)
Extrapolated mathematical models

\[ y = -11217x^2 + 59091x - 200466 \]
\[ R^2 = 0.3035 \]

\[ \Sigma(\text{Estimate Average}) = 547 \ (\text{MCt}) \]
\[ \Sigma(\text{Estimate Polynomial}) = 1,217 \ (\text{MCt}) \]

- Sample size is not enough to apply the mathematical method

Sources: JICA Vietnam Study
Dynamic land use modelling

1. The GEOMOD2 model (Pontius et al., 2001).

2. The CLUE-S model (Verburg et al., 2002).

3. LAND CHANGE MODELER (CLARK Uni Lab)
LAND CHANGE MODELER
( CLARK University Lab)

Predict land use change in the future based on the some physical conditions drivers: roads system, Elevations, Slope.

(Source: Amintas Brandão Jr GISDE master program 2009-1011, Clark University)
Dynamic land use modelling (other models can apply)

4. MCE (Multi criteria Evaluation) (CLARK Uni Lab) Can employ some other factor related to social–economic drivers and trade off

![Image of MCE multi-criteria evaluation software interface]
Forest cover change 2008
Prediction of forest cover change 2020
Prediction of forest cover change in high scenario 2020
Extrapolate the RLs
Methodology of Extrapolate the RLs

Not clear on Methodology so far (need to take into account country circumstances required by UNFCCC)

Adjusted Historical Based (AHB) method projects the future emission based on historic emission adjusted to national or subnational circumstances such as population, forest cover proportion (proportion of land area covered by forest, in percentage), etc.
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Provisional Reference Emission Level of Central Sulawesi Draft

Annual Emission (ton Co2-eq/yr)

- 2000-2003: 19,012,369
- 2003-2006: 21,054,852
- 2006-2009: 4,775,022
- 2009-2011: 11,714,280
- 2000-2011: 14,346,708
- 2011-2020: 14,346,708
The relationship of forest cover proportion and population in Central Sulawesi

\[ y = -7 \times 10^{-6}x + 88.1 \]

\[ R^2 = 0.9755 \]
Provisional REL calculated using historical based method
Provisional REL after adjustment
Problems and Solutions
Problems

1. Mathematical models
Not enough historical data,
RLs depend on underlines variables (Policies, Markets) that are unpredictable

\[ Y = aX_1 + bX_2 + CX_3 + dX_4 \]
Extrapolated mathematical models

\[ y = -11217x^2 + 59091x - 200466 \]
\[ R^2 = 0.3035 \]

\[ \Sigma(\text{Estimate Average})=547 \text{ (MCt)} \]
\[ \Sigma(\text{Estimate Polynomial})=1,217 \text{ (MCt)} \]

- Sample size is not enough to apply the mathematical method

Sources: JICA Vietnam Study
2. Econometric modelling and Dynamic land used model
- Lack of Historical data
- Spatial analysis works for two time periods
- Work well for Physical Variable
Dynamic land use modelling

4. MCE (Multi criteria Evaluation) (CLARK Uni Lab) Can employ some other factor related to social – economic drivers and trade off
Discussion
If we can’t figure it out, should we use the average value of Historical Emission?
THANK YOU FOR YOUR ATTENTION!