Reference Emission Levels (REL) in the context of REDD and land-based NAMAs: forest transition stages can inform nested negotiations

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World Agroforestry Centre
TRANSFORMING LIVES AND LANDSCAPES

ICRAF[1]

Key points:	**Action perspective:**
1. We propose that different REL calculation techniques apply to different stages of forest transition, at (sub)national level, to fulfill fairness and efficiency principles, as a starting point for NAMA and REDD negotiations	Accept that different rationales for REL derivation can coexist within a negotiation framework, targeting short, medium and long term goals
2. In the absence of an internationally agreed forest definition all efforts to segregate 'forest' related emissions as part of land-based emissions remain contested; for example Indonesia's recent deforestation rate varies from -0.5 to 3% depending on the forest definition used	Acknowledge that the concept of 'reference level' of deforestation is non-operational and cannot be used unless a stringent 'natural forest' definition can be agreed upon internationally
3. The assumption that drivers of tree cover transition in an area remain constant in extrapolating historical emissions across heterogeneous local conditions is not appropriate	Accept that linear temporal and spatial extrapolation of historical emission trends is neither a realistic nor a fair basis for determining REL
4. Evaluation of existing (pre-REDD discussion) 'planned deforestation' provides an indication of feasible emissions, as regards infrastructure, labor and capital requirements for conversion	Accept pre-REDD discussion development planning as meaningful input into REDD negotiations, as basis for 'planned reduction'
5. Rather than 'objective' REL definitions, linked negotiations at the national-international level with that at subnational-national level will have to clarify what a country can and want to take responsibility for as reference emission level within its Nationally Appropriate Mitigation Actions and/or as basis for supported REDD+ activities	Accept that negotiations on REL have to cross the line from 'objectively verifiable' to 'negotiated' commitment within nested subnational/national/international agreements
6. The 'forest transition' concept can be operationalized as typology of subnational entities within a large country and/or a regional context; we provide an example for Indonesia and suggest how multiple REL metrics can be used in negotiating subnational commitments to fairly and efficiently reduce emissions at national scale	Invest in the data synthesis needed to replicate a 'forest transition stage' typology at subnational level, as element in a (sub)national negotiation process or at country level within a regional negotiation process

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Paragraph 70 of decision 1/CP. 16 encourages developing country Parties to contribute to mitigation actions in the forest sector by undertaking the following activities, as deemed appropriate by each Party and in accordance with their respective capabilities and national circumstances:

(a) Reducing emissions from deforestation;

(b) Reducing emissions from forest degradation;

(c) Conservation of forest carbon stocks;

(d) Sustainable management of forests;

(e) Enhancement of forest carbon stocks;

Paragraph 71 of decision 1/CP.16 request developing nations aim to undertake activities outlined in paragraph 70, in accordance with national circumstances and respective capabilities, to develop the following elements:

(a) A national strategy or action plan;

(b) A national forest reference emission level and/or forest reference level or, 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

Paragraph 2 Annex I (d, f and g) to decision 1/CP.16 promotes and supports the following safeguard:

(d) The full and effective participation of relevant stakeholders, in particular indigenous peoples and local communities, in the actions referred to in paragraphs 70 and 72 of this decision;

(f) Actions to address the risks of reversals;

(g) Actions to reduce displacement of emissions.

Paragraph 130 of decision 1/CP. 16 decides that capacity-building support to developing country Parties should be enhanced with a view to strengthening endogenous capacities at the subnational, national or regional levels, as appropriate, taking into account gender aspects, to contribute to the achievement of the full, effective and sustained implementation of the Convention, by, inter alia:

(c) Strengthening climate change communication, education, training and public awareness at all levels;

(d) Strengthening integrated approaches and the participation of various stakeholders in relevant social, economic and environmental policies and actions;

Introduction

Reference Emission Levels (gross) and Reference Levels (net) requires the combination of a land use transition matrix and typical C stocks per land use type.
Four ways of calculating REL for any (sub)national entity are:

- ❖ REL/RL1A: Projected emissions are based on historical emissions
- ❖ REL/RL1B: Projected emissions are based on historical emissions relative to remaining carbon pools
- ❖ REL/RL2: Future emissions are projected based on land use plans (forward-looking scenario)
- ❖ REL/RL3: Emissions levels projected on the basis of political commitment

The scope of this contribution to the quantification of REL/RL is:

- Explore consequences of various forest definitions for the metrics proposed
- Assess REL/RL options and their consequences
- Identify potential technical barriers and solutions
- Suggest ways to achieve capacity strengthening of local stakeholders

Our purpose is to:

- Clarify need for agreed forest definition and scope of reducing emission from land-based sectors in order to reach the objective to reduce emissions
- Suggest simple scientific-based guidelines for REL/RL development supporting negotiations
- Recommend ways to overcome technical barrier, including data gaps
- Share lessons learnt from building capacity of local people to develop options for setting REL/RL within the overall land use planning specifically targeted for low land-based emission development as a proof of concept

Forest and tree cover transitions: challenges to the scope of REDD+

The terminology 'forest' within the communication of paragraph 70 of decision 1/CP. 16 is vague and lead to exclusion of tree cover and its associated emissions. The Indonesian Forest Climate Alliance in 2007, ahead of the Bali COP13 identified the lack of agreed forest definition, alongside contested C rights and tenure, and the need for multi-scale, multi-paradigmatic benefit distribution mechanisms as key issues. Progress is still lacking on all these issues. When the 'avoided deforestation' discussion of the CDM transformed into the RED / REDD / REDD+ debate, it inherited the forest definition that had been developed for A/R-CDM and its associated problems (van Noordwijk et al., 2008). In delineating the REDD+ policy domain it is evident that a definition that included 'temporarily unstocked' forest lands and was thus 'institutional' was problematic and that a 'vegetation based' definition of land cover is the appropriate one. Countries have to select any tree cover percentage between 10 and 30% as threshold of their forest definition for A/R CDM; however in data collection and political discussion the 'forest lands' concept still dominates over the objective description of a country's tree cover[2].

The current carbon accounting methods are firmly built on a segregation of forests, wetlands and agriculture as separate categories of land. Yet, overlaying estimates of global tree cover (derived from MODIS) and FAO classifications of forest and agriculture, suggests that both land categories contain the full range (0 - >60%) of tree cover. In consequence, emissions from loss of tree cover occur on 'agricultural lands'; as well as from 'forest lands' (Ekadinata et al. 2010).

[2] The issue may have been deliberately stalled to maintain a broad platform of support. Yet, lack of clarity on exactly what part of the overall problem any specific policy proposed is addressing may ***increase*** the chance of getting a policy accepted initially, but ***reduces*** the chance that it will be implemented. The main alternative that has meanwhile emerged is the incorporation of REDD into a broader land-based NAMA concept, that relies on existing, nested governance systems that span the development-environment mandate in which REDD can make sense.

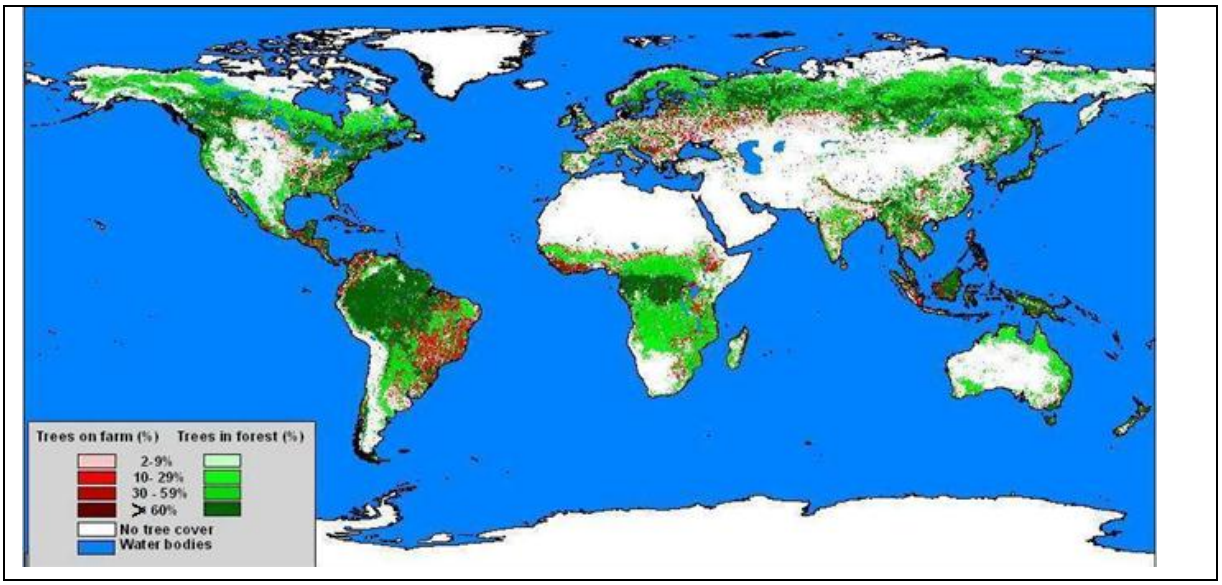

Figure 1. Tree cover in areas designated as 'forest lands' or 'agriculture' range from 9 to >60% when MODIS tree cover results are combined with FAO agricultural land shape-files (Zomer et al. 2009)

The IPCC guidelines for national GHG accounting (IPCC, 2006) do not yet explicitly ask for reporting changes in tree cover of 'agricultural lands'. Zomer et al. (2009) derived that nearly 50% of agricultural lands meet the 10% mark (minimum tree cover for national forest definition under CDM) while in C. America and SE Asia 50% meet the 30% mark (maximum value a country can choose as basis for its forest definition).

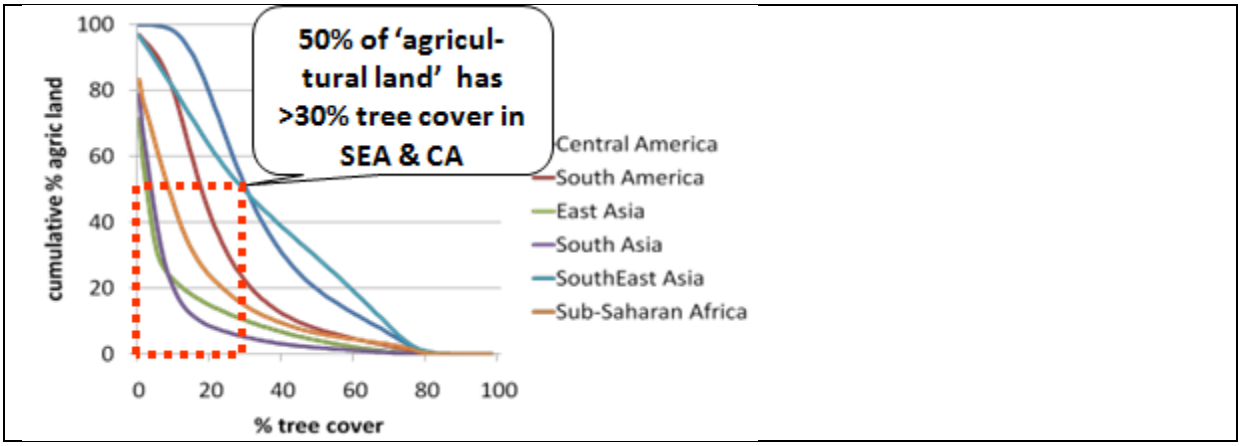

Figure 2. Fraction of agricultural lands classified by MODIS tree cover in six regions of the developing world (Zomer et al. 2009)

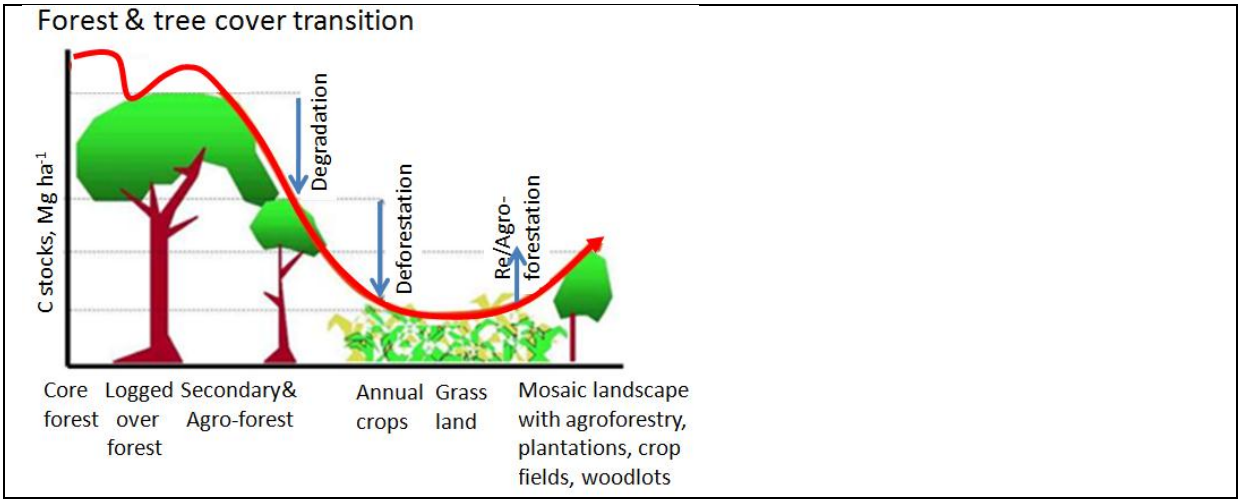

Figure 3. Forest transition curve as underpinning of space-time and institutional linkages of tree cover inside and outside of 'forest'

The various phases of tree cover or forest transition (Fig. 3) that coexist within a national economy interact at the level of 'drivers' and usually also at the level of 'actors'. Current treatment of 'forest' as a separate but single category within the 'land-based emissions' is problematic on several accounts:

1. Drivers and actors of tree-cover change interact across the forest-agriculture institutional divide in the landscape, and forest protection can lead to 'leakage' to trees outside forest; a holistic landscape based accounting is needed to assess real emission changes
2. Tree cover types differ widely in productive and ecosystem service functions: a narrow forest definition might be appropriate for biodiversity aspects but misses a large share of emissions, with a relaxed forest definition "co-benefits" cannot be taken for granted.
3. Planned and unplanned changes in tree cover as part of development trajectories have multiple stakeholders: their engagement requires a diversified approach within a holistic landscape context, not well served by a forest ⇔ nonforest dichotomy.

Negotiated, multi-stakeholder land use planning in a nested governance context is probably essential to safeguard the stakes of sub-national government entities, local and indigenous communities. REL/RL development can and should be part of such nested bottom-up negotiation process, rather than referring to 'objective' top-down assessment.

Consequences of lack of agreed forest definition for deforestation rates

Reference Levels (RL) will only use 'deforestation rates' as basis. Without clarity on the forest definition used, the concept of deforestation rate has little value. New analysis for Indonesia (Fig. 4) shows values between -0.5 (net increase in forest area) to +3% for the 2005-2010 period. Earlier literature has commented on the lack of temporal consistency in FAO forest data sets.

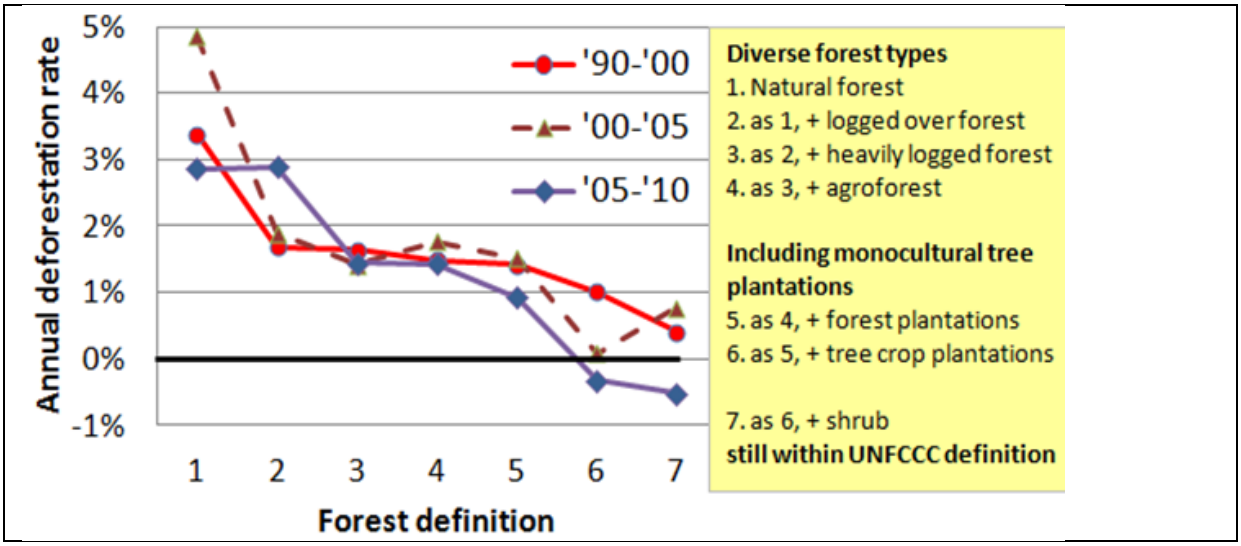

Figure 4. Dependence of annual deforestation rate for Indonesia in three time periods (1990-2000, 2000-2005 and 2005-2010) on the operational forest definition and the types of woody vegetation it includes, all derived from the same interpretation of land cover on satellite imagery (ALLREDDI data)

Evaluation of existing (pre-REDD discussion) 'planned deforestation' as indication of feasible emissions

Dewi et al. (2012) used an example from the province of Papua in Indonesia to calculate the REL options based on projected emissions of baseline scenarios, based on the inventory of existing plans and historical land use changes are:

- ❖ REL1: (BAU scenario); in the example, the projection was made using historical patterns and rates of land use/cover changes specific to institutional land allocation in the province 2000-2005 (it is preferable to use the most recent available land use/cover map).
- ❖ REL2: Future emissions are projected based on land use plans (forward-looking scenario); in this example, the plans are taken from indicative maps of the Hutan Tanaman Rakyat (peoples' plantations), integrated development of new areas for food and energy, and plans of forest conversion into oil palm plantations.
- ❖ REL3: Emissions levels projected on the basis of the commitment made by the Governor (2009) that at least 50% of convertible forest is to be conserved.

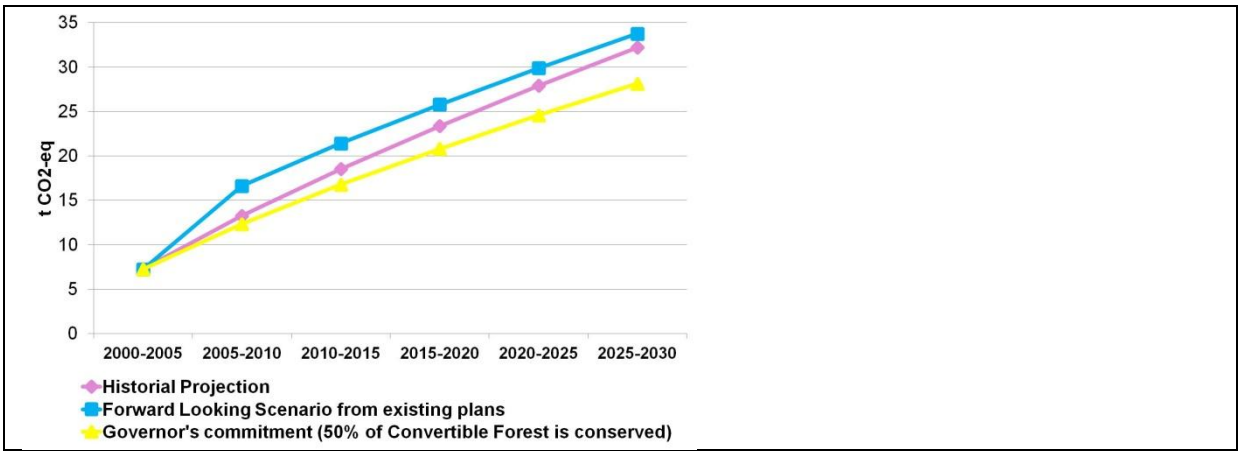

Figure 5. Projections of different reference emissions levels, based on historical projection, existing plans, and gubernatorial commitment to conserve convertible forest (Dewi et al., 2012)

Figures 5 shows the REL options based on the 3 baseline scenarios. In this particular province, where forest cover is high, population density is low and forest transition is in the early stages, historical land use changes have produced lower emissions and a lower linear projection than the existing plans. In different parts of the country, where the forest transition stage is more advanced and the remaining forest cover is more limited and is located mainly within conservation zones, the forward-looking emissions from the existing plans are lower than the historical projection. Regulation and negotiations on the REL setting should acknowledge the variations in past and future trajectories as well as the varied stages and circumstances affecting the level.

Proposal for linking REL calculation to forest transition stage as starting point of negotiation

Therefore in addressing the efficiency and fairness principle, sub-national or national level REL/RL should be set based on the reference area, which can be a country if it is big and heterogeneous such as Indonesia or Brazil, or a region of smaller and considerable less heterogeneous countries, such as Mekong and African countries.

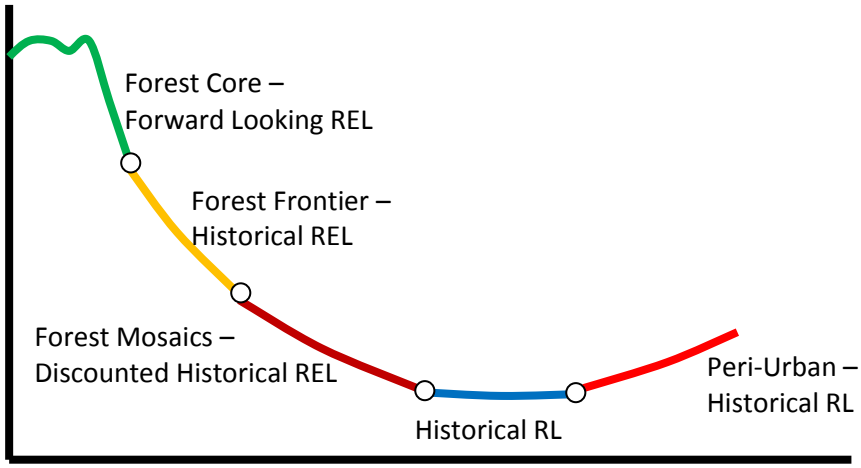

Figure 6. Proposal to tie the quantitative derivation of REL to the stage of forest transition, as starting point for subnational negotiations

Three rules of setting REL/RL can be imposed based on the Forest transition stage which embraces development stage, historical emissions and the current C-storage in biomass:

- Forward looking gross emissions as REL based on the reasonable development plan based on local labor availability, for under developed areas with high stock and low historical emissions, i.e., early stage of Forest Transition
- Historical gross emissions as REL or emission projected by driver modelling, for those at the stable rate of forest conversion
- Discounted historical gross emissions as REL, for those at the stage of declining rate of forest conversion, i.e., high past emitters, depleting C-stock beyond average per capita standing forest
- Historical net emissions as RL, for areas where net emissions are negative in the past, i.e., stage of forest recovery

Operationalization of 'forest transition' as typology of subnational entities

As an example of the way this forest transition concept can be operationalized, Figure 8 presents results for Indonesia at district level. In combination with the proposed rules for REL quantification, this typology suggests a specific starting point for subnational negotiations of the way the NAMA commitment of 26% across-the-board emission reduction relative to a projected 2020 emission level can be allocated across the districts and provinces. Districts with the highest historical emission levels will to accept more-than-proportional reductions to create space for part of the forward looking projections of forest core areas.

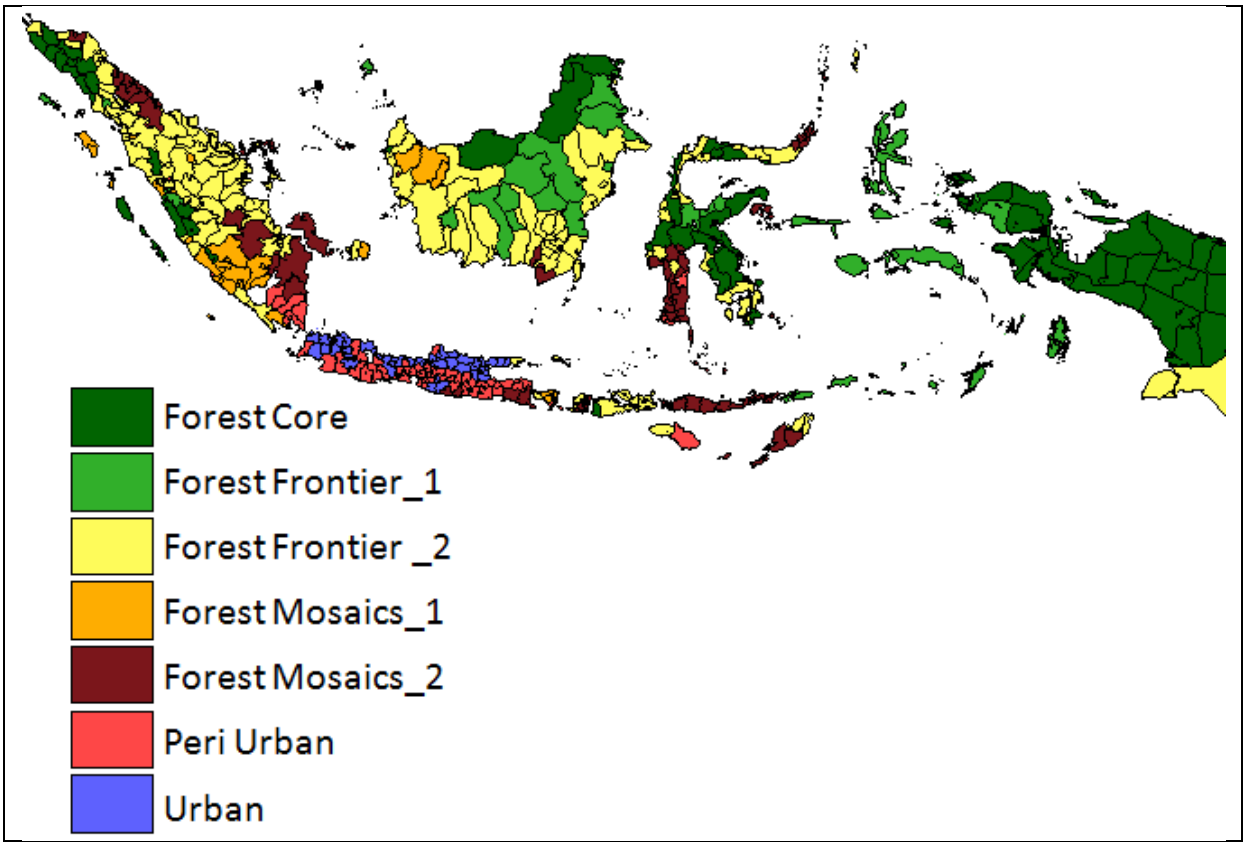

Figure 7. Classification of districts (kabupaten) in Indonesia according to stage of tree cover transition based on tree cover, recent land cover change, and human population density (Dewi ret al., in prep.)

Importance of inter- and sub-national negotiation rather than 'objective' REL definition

At the international level, aggregation of national REL/RL and additionality define the success of climate change mitigation action from land-based sectors and should readily translated into how much they contribute to maintaining GHG at the stabilization level (globally appropriate mitigation actions - GAMA). At the national level, aggregation of sub-national REL/RL and additionality and their impact on the national economies and development define the success of the climate change mitigation (NAMA). At the sub-national level, the additionality and their impact on local livelihoods, local economies and development are key indicators to the

appropriateness of the mitigation action (locally appropriate mitigation actions - LAMA). It is utterly important that REL/RL is set to balance between the target and the success in achieving the real target (efficiency) but at the same time recognizing the variation and complexities in the 'need to emit' development pathways in the under developed sub-national areas (fairness).

Appendix Guidance for construction of forest transition typology:

- Historical data encompassing land use/cover maps 1990, 2000, 2005 and if possible 2010 with legend of land cover maps that are meaningful in reflecting Carbon storage should be consulted. The best available plot level dataset should be used to estimate aboveground biomass and simple changes in C-stock could be used to estimate emissions. For wetland and peatland, below ground C-stock should be estimated conservatively;
- Select a layer that are meaningful in determining a planning unit for development and mitigation action which is large enough in terms of preventing leakage and has an economy of scale that is feasible to generate technical capacities, small enough in terms of homogeneity within the unit with regards to biophysical and socio-cultural and economic conditions
- Produce typologies to label each planning unit a stage of Forest Transition, e.g., Forest Core, Forest Frontier, Forest Mosaics, Peri-Urban and Urban, that reflects the emissions from deforestation, degradation and other land use changes in the past and the existing carbon stored in biomass. A layer of population density and gross regional product can also be used to produce the typologies. The typologies can be translated into indicators such as: fraction of land use/cover, changes in land use/cover, population densities, GRP
- Revisit every 5 years with the most recent land use/cover maps if the typology holds; some areas might advance from Forest Core to Forest Frontier, e.g., such that REL has to be re-adjust
- For countries/regions where historical dataset is not available, assistance to the COP for financial and technical support should be requested and in the period of 6 months after the support is given, the maps should be finalized using the advances in Remote Sensing technology and freely available satellite imageries. The best available plot level data should be used to estimate the biomass and C storage. Compiling the available data should take less than 6 months.

Process for Communication

- Once guidelines and typologies are agreed upon by sub-nationals and national, and by countries and region, simple tools should be used to strengthen capacities of the relevant stakeholders to get engaged in the REL/RL setting process.
- Proof of concept is available by the experience with district level governments and relevant stakeholders in Sumatra, Indonesia, that such above guidance is doable and strengthening technical capacity is feasible within a relatively short period of time
- Sub-national or countries to submit to the national or regional coordinator to aggregate and sum the REL/RL
- Negotiation process among sub-nationals and among countries with the same reference area might be necessary
- Countries to submit to the COP and submissions will be assessed by an expert review team equitably composed by Annex I and Non Annex I experts assisted by the UNFCCC secretariat and adopted by the COP.

Acknowledgement

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