Forest Carbon Partnership Facility (FCPF) – Working Group on Methodological and Pricing Approach

Short submission on reference levels and additionality

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1 Introduction

The idea of paying a REDD+ country to protect its forests in exchange for carbon offsets can potentially save two birds with one feeder – reducing overall emissions by keeping forests intact, and ensuring associated forest co-benefits, such as biodiversity and socio-economic benefits. The problem with REDD+ though is that there are essential problems that are mainly linked with **trust**. The trinity of *permanence*, *additionality* and *leakage* has been created to deal with such issues of "trust":

1. ***Permanence***, defined by the UNFCCC Special Report on LULUCF as "the longevity of a carbon pool and the stability of its stocks" constitutes the basic underlying concept or framework for all activities conducted to mitigating GHG in forestry. In a REDD+ project, permanence is about ensuring that an investment (i.e. the forest) remains intact for a long period into the future to account for the carbon being offset by the buyer.
2. ***Additionality*** is a more obscure concept which is basically a way of describing 'what would have happened anyway'. In other words, if a particular area of forest was never targeted for deforestation, then being paid to maintain it is a false investment.
3. ***Leakage*** is the unanticipated increase in emissions outside a REDD project's accounting boundary. In other words, the original forest area that was targeted for protection under the agreement remains intact, but the deforestation that would have otherwise occurred merely gets shifted to an adjacent forest, so the net effect is the same (i.e., no emissions reduction).

The questions are how to police permanence, additionality and leakage, e.g. how to prove 'what would have happened anyway'? Finding politically acceptable solutions is an extremely difficult task and are among the main reasons that hampers the implementation of REDD+. This in spite of the fact that "the two birds with one feeder approach" is a most valid approach. E.g. leakage can also work in the opposite direction, i.e. forest protection can become an interesting approach and instead of just shifting the deforestation activity elsewhere, people might want more forests to be protected after a successful REDD+ programme is implemented somewhere. The points here is that being too rigid ensuring the concepts of additionality or leakage, the risk is that we might fail to implement up scaled REDD+ on the ground as an effective and efficient GHG mitigation option.

In a REDD+ action which is designed for the specific duration of an emission reduction agreement, warranting additionality is still considered essential within the debate on REDD+ policy design. The additionality concept implies that REDD+ payments trigger a halt in deforestation and forest degradation, respectively assures conservation of carbon sinks and promotes enhancement of sinks that would not occur otherwise.

Policy makers need to be able to discern the policy's impact from any other factors affecting deforestation and forest degradation to ensure that payments are not issued "for nothing". Moreover, this information is necessary both to decide *ex-ante* which areas to target with which incentives and to justify *ex-post* the budget spending towards the donors or to eventually make credits fungible for a carbon market (buyers).

The commonly presented solution is to estimate a counterfactual, a so-called business-as-usual (BAU) reference line, against which policy impacts can be measured. Next to this BAU reference line, a crediting level is necessary that determines when to issue payments. The crediting line may, but need not, be equal to the BAU reference line.

Although this approach appears to be plausible and straightforward, we question the reliability of results that can be obtained due to large uncertainties in the data and estimation models. We present an alternative, second-best "cap" solution that rather aims at maintaining a defined amount of forest cover. The advantage of this approach is that it would not need to rely on uncertain projections, while coming at the cost of weakening the additionality criterion.

The text is structured as follows: in section two we review the literature on methods to estimate reference lines and in section three we discuss issues of including large *vs.* small spatial ranges in the reference line computation. Section four discusses problems with data and estimation uncertainty and presents our suggestion for an alternative "cap" incentive structure that is independent of BAU reference line estimations. Section five concludes.

2 Reference line estimation

Once the REDD+ policy is implemented, BAU reference lines are needed to provide information on how deforestation levels would develop if the policy were not implemented. All suggestions on reference line estimation procedures, in some way or another, make use of historical data to project future deforestation and forest degradation. Harris et al. (2009) suggest that some general criteria should apply to the estimation procedures: they should be standardized, accurate, transparent, credible and conservative. Relevant questions are how often, resp. at which intervals, the reference lines need to be updated and whether estimates can be improved by including additional variables that are characteristic of national circumstances. Moreover, there are discussions on how to reward early action in preventing deforestation and to respond to equity concerns (Okereke and Dooley, 2010). Gutman and Aguilar-Amuchastegui (2012) categorize the propositions on reference line estimation procedures into three groups: (i) strictly historical, (ii) historical adjusted and (iii) models of future BAU scenarios.

- ***Strictly historical***

The most common, and probably simplest suggestion, is to compute the average deforestation rate of the past years (typically the last decade) and use this average as reference line (Angelsen, 2008). To construct a floating average, the computation could be up-dated in intervals, for example every three years. Although the approach is simple, it has been criticized as being too static (Murray, 2009). If this approach is chosen, it is probable that requests for adjustments of the crediting line to account for national circumstances will be made.

- ***Historical adjusted***

Approaches in this group are similar to the strictly historical approach but additionally take into account factors such as countries' deforestation rates relative to global averages (Mollicone et al., 2007) or pan-tropical averages (Achard et al., 2005). Moreover, reference lines may be adjusted to national circumstances by weighting them with development adjustment factors (Okereke and Dooley, 2010). Angelsen (2008) particularly points out that simple strictly historical computations may be misleading because, according to forest transition theory, deforestation is not a linear function of economic development.

- ***Models of future BAU scenarios***

This last group refers to more elaborate statistical estimations of future BAU scenarios. The estimation models can include variables such as productivity of major crops, agricultural and non-agricultural GDP, or areas declared as national parks (Umemiya et al., 2010). Including additional factors may improve the predictive power of a model but is likely to come at the cost of decreasing transparency of the approach and becoming difficult to understand.

Which approach is chosen for the computation of the reference line will also affect the definition of the crediting line. It may be advantageous to provide for adjustment flexibility in one of the lines while applying a stringent universal rule for the other line. For example, if the 'historical adjusted' or a modeling approach is chosen for the reference line, it may in turn be possible to define a universally applicable rule for the crediting line. While if the 'strictly historical' approach is inflexibly applied to all countries, adapting the crediting line to national circumstances will most likely be inevitable. Yet, the politically more acceptable solution may be <u>to provide room for flexibility in the reference line definition and to apply a stringent rule for the crediting line</u>.

3 Spatial range

The area for which data is included in the computation influences the values of the resulting reference level but may in addition have an effect on forest conservation incentives. For example, the area included could be limited to the area that is managed by those liable for the REDD+ project. Alternatively, the entire area that is influenced by the same external drivers of deforestation may be included. Table 1 below compares the advantages and disadvantages of these two options. An issue in deciding on which spatial range to include is the tradeoff between backing-out local idiosyncratic variation in deforestation rates by including large areas and the risk of overvaluing project success if leakage from the project to the reference area is substantial.

Table 1: Advantages and disadvantages of using different spatial scales in reference line estimation

Spatial range included in reference line	Advantages	Disadvantages
Only project area within a country (sub-national)	– Success or failure is strongly confined to the manager's skills in this isolated system – Relatively few risks that are out of project manager's control – MRV effort is modest the smaller and more homogenous the area is	– Comparatively small variations in the historical deforestation data (e.g. due to local natural fires or other extreme events) can have a big impact on reference lines – Double difference computations over time to evaluate project success are not possible – May result in strategic choices of project areas to optimize RL – If floating averages are used, achieving improvements over the RL (i.e. project's previous accomplishments) may become increasingly difficult – Could result in incentives to slow accomplishments to optimally harvest payments
All area s.t. same major drivers of deforestation (national or international)	– A large-area average provides information on general trends while backing-out local-level idiosyncratic "noise" – The same reference line may be applicable to many smaller projects that are located within the larger area and thus allows cross-project comparisons – Double difference computations over time to evaluate project success are possible	– If substantial leakage from the project to the reference area occurs, a comparison of the two areas may overrate the project's success – MRV costs may be substantial

4 Data problems and an alternative "cap" incentive structure

The computation of reference lines inevitably requires a large amount of data. A much-cited problem is the deficient availability of data for many countries and the poor quality of obtainable data (Herold et al., 2012). Moreover, the drivers of deforestation are not yet fully understood (Umemiya et al., 2010; Herold et al., 2012). Case studies have demonstrated that the results of reference line computations strongly depend on the methods used (Umemiya et al., 2010). In view of these data and estimation uncertainties, the likelihood of relying on poor projections of future deforestation is fairly high.

Some state that data availability and quality will increase over the years, implying that correcting currently faulty projections is only a matter of time. Although data improvements will happen, particularly through the use of better and more accurate remote sensing methods, we do not share the view that this alone will improve estimations. The problem is that, as time passes, it will become increasingly more difficult to estimate how deforestation rates would hypothetically develop if REDD+ were not implemented. For example, assuming REDD+ starts in 2013, estimating a BAU reference line for 2013-2016 based on historical data up to 2013 is difficult. Estimating it for 2033-2036 based on historical data up to 2013 sounds almost frivolous since effects of the policy and other factors (e.g. those related to climate change itself) will become increasingly intertwined.

If reference lines are continuously updated to produce a floating average, data on deforestation rates that are affected by the REDD+ policy will enter the computation. The resulting reference line can then no longer be seen as a policy-free BAU scenario. Using such a reference line rather has strong similarities to ratchet-effects in threshold payment schemes (Weitzman, 1980; Murphy, 2001). The term ratcheting refers to incentive schemes that make payments conditional, for example, on surpassing the past years performance. Although attractive at first sight, it has been found that recipients have incentives to smooth performance over time to avoid stark increases in thresholds (Murphy, 2001).

In sum, the current situation provides room for strategic lobbying for the most advantageous reference line setting procedure or even fraudulent data submissions to optimize benefit flows. <u>It is surprising that, in spite of these major shortcomings, so much consideration is given to the reference line approach without investigating alternatives.</u>

One possible alternative is to define a "cap" on deforestation as was done for greenhouse gas emissions in the Kyoto Protocol (Gutman and Aguilar-Amuchastegui, 2012). For example, the goal could be to maintain the average forest cover of 2010-2012. A major benefit of defining a cap in this way is that projections of future deforestation rates become redundant. It may, however, come at the cost of weakening the additionality criterion.

A challenge lays in designing incentives that are attractive to countries with high deforestation rates as well as early action countries. A possible solution is to issue payments based on countries' degree of goal attainment. Payments would decrease rapidly as forest cover falls below the level defined in the cap, i.e. maintaining the forest cover as defined in the reference period generates high payments while deforesting is met by opportunity costs of forgone forest conservation payments. Figure 1 schematically shows this incentive structure.

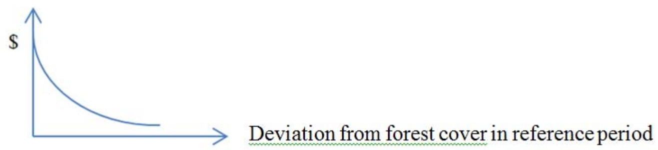

Figure 1: Incentive payments relative to deviation from the goal defined in the cap

This approach implies that payments will be made for forests that – based on current knowledge - were not at risk of being cut. Forest conservation is rather seen as ecosystem service that is rewarded irrespective of the immediate deforestation threat. Indeed, REDD+ explicitly includes forest conservation which means the retention of the absolute carbon stock which is to be credited. While reduced D&D can be measured against a reference scenario at national level, forest conservation by its nature implies stasis, i.e. the stock levels remain more or less the same over the years. As proposed by Skutsch and Trines (2010), the crediting of forest conservation unlike that of reduced D&D, would require some type of temporary crediting or cover for liability in case of loss.

Early action countries should obviously be in favor of such an approach. Countries with high rates of deforestation would receive strong incentives to curb forest destruction. The approach would score high in terms of equity, because all countries would be treated equally and face the same incentive structure. Yet in terms of efficiency, this approach may not perform as well because payments would not be explicitly targeted to the most threatened forests. However, given that international leakage is potentially a major issue, it may be rational to make payments even to countries with currently low deforestation rates.

5 Conclusions

This short thinking paper identified from the literature three reference line estimation procedures that all make use of historical data. Due to poor quality and quantity of available historical data, the likelihood of relying on poor projections of future deforestation is fairly high and jeopardizes the quality of reference levels. When deciding on which spatial range to include, the tradeoff between backing-out local idiosyncratic variation in deforestation rates by including large areas and the risk of overvaluing project success if leakage from the project to the reference area is substantial, needs to be particularly considered. The authors conclude that by using a "cap" incentive structure, the projections on future deforestation rates would become redundant. However, this most probably will come at the cost of weakening the additionality concept. In the point of view of the authors, such weakening of the additionality concept would be acceptable as long as the overall permanence concept remains untouched.

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