Optimal reference level setting for REDD+

Key message

There is considerable complexity to determining an optimal approach to setting reference levels for REDD+, given the trade-offs between effectiveness, efficiency and equity that arise in different approaches. Additional progress is required at both the technical and political levels.

1   **Reference levels are used to evaluate performance in reducing emissions through REDD+. The terms 'reference level' and 'baseline' are frequently used interchangeably in the REDD+ debate, but they can mean different things[1]:**
    - A 'business as usual' baseline is the prediction of what would happen without REDD+ and the benchmark for measuring the effect of REDD+ policies.
    - The 'crediting baseline' is the benchmark for rewarding the carbon rights holder if emissions are below that level.
    - 'Reference levels' are often used to refer to the crediting baseline.

2   **A number of different approaches for establishing reference levels have been proposed[2].** These have different advantages and disadvantages from the perspective of effectiveness, efficiency and equity (Table 1). As a result, there is still no agreement on what constitutes a reference level, or the criteria or indicators for setting them[3] and particularly how to factor in national circumstances. It is also important to note that reference level setting is partly a political process – i.e. it is a political negotiation in terms of where the crediting baseline is set.

3   **Comparative studies of reference level designs have been conducted, reaching the following conclusions.** Key questions include:
    - Depending on the approach used, there is a large range in the total credited emissions avoided for the same quantity of actual emissions reductions[4].
    - Most REDD reference level approaches result in substantial emissions

Figure 1: The difference between Business as Usual and crediting baselines in REDD+
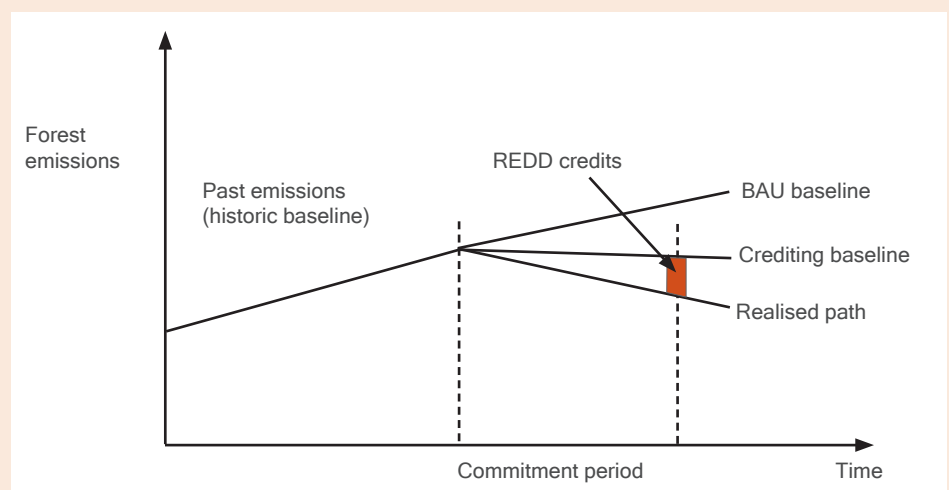
Table 2: Advantages and disadvantages of different approaches to establishing reference levels

Approach	Advantages	Disadvantages
Historical Based solely on past emissions from each country	• Historical deforestation rates are one of the best predictors of future deforestation in the short to medium term (Meridian 2009) • Additionality is more easily demonstrated • More transparent measure, less susceptible to gaming	• Provides incentives only for countries with high historical rates • Do not capture future changes in rates, but recalculation after each performance period could overcome this • Susceptible to leakage
Stock/average Based on current forest carbon stock or forest area of each country and possibly a global average deforestation/emissions rate	• Incentives to all countries • Link to average global rates could minimise the risk of credits being generated where real emissions reductions do not exist • Does not penalise countries with past good performance	• Pure carbon stock approach could result in crediting of activities where there is no risk of emissions • Politically difficult because incentives based on global emissions means countries are susceptible to other countries' actions
Projected/modelled Based on past deforestation and estimates of future deforestation drivers and key social, economic, political and technological variables	• If possible to estimate, offers highest level of additionality • Could offer appropriate incentives to countries in different stages of the deforestation process, minimising risk of leakage	• Complexities of establishing systems • Sensitive to assumptions and reliability of data • Increased opportunities to game the system
Combined Based on a formula that combines a measure of individual country performance against their own historic emissions baseline, and performance against a global emissions baseline	• Inclusive of many countries • Minimises leakage • Adjusted to national circumstances	• Higher rewards to high deforesting countries, but less than for purely historical reference levels

Sources: Meridian, 2009; Griscom, 2009; Eliasch, 2008.

reductions and the differences between models are small compared to the magnitude of emissions reduced[5].

- REDD is most climate effective and cost efficient where incentives for reductions in deforestation in historically high deforestation countries are balanced with incentives for prevention in historically low deforestation countries. This includes proposals such as Combined Incentives and Stock-Flow[6].
- Leakage prevention and incentives for broader participation are key issues.
- The climate effectiveness and cost efficiency is dependent on the elasticity of demand for frontier agriculture[7].
- Across all reference level designs, emissions reductions were greater in Asia and Latin America than in Africa, as the data sets used indicate that Asia and Latin America contain more land area on which carbon density is high and potential agricultural rent is low.

4   **In order to find a balance between the effectiveness, efficiency and equity of REDD+, different criteria can be used to help adjust for national circumstances**[8]. Meridian (2009) proposes the use of four main criteria for setting reference levels that are linked to a country's stage in the forest transition curve.
   - Historical national deforestation. For example, over the past 10 years with some flexibility based on data availability, and updated every five years.

- Forest cover. Relatively higher reference level given to countries with more than a given percent of the land area under forest cover (with some flexibility based on national circumstances).
- GDP per capita. Relatively higher reference level given to countries below a given GDP per capita.
- Global additionality factor. An adjustment to ensure the additionality of global emissions reductions from REDD+, at the minimum, and possibly also deeper REDD cuts.

In general, comparative studies weighting of reference levels away from historical national deforestation and toward forest cover and per capita GDP criteria tends to reduce their climate effectiveness[9].

5   **Procedures for setting reference levels**: The process for setting reference levels has important implications for country involvement. There are four main options for setting reference levels at the international level[10]:

a   Negotiated agreement at a future COP, where a table of negotiated reference levels is agreed based on an agreed formula and country specific data.

b   Future COP decisions endorse reference levels proposed by countries as they become ready to participate. The SBSTA would periodically endorse proposed reference levels that would then be forwarded to the COP.

c   Parties propose reference levels which are endorsed by the COP after recommendation by a formal committee that uses external assessments and agreed-upon criteria

d   Combination of b and c whereby the SBSTA establishes an advisory committee

Angelsen (2009a) argues that the risk of inflated reference levels calls for strong expert involvement, and options c and d might therefore best ensure that the overall aim of UNFCCC is met.

6   **Adjusting reference levels over time**: A distinction needs to be made between:

a   A reference level that changes over time. It is often suggested that reference levels should be set to decline over time to account for changes in business as usual emissions and to incrementally increase reductions from the sector; and

b   A reference level that is renegotiated or reset over time to correct for changes in rates of emissions and ensure the REDD+ policies continue to be effective. This could occur through the re-adjustment of the reference level at the end of each performance period. Brazil has taken a similar approach for the Amazon Fund, where the 10 year rolling average of past deforestation is revised every 5 years.

The FAO's Forest Resource Assessment (FRA) 2010; what do the preliminary findings mean for REDD+?

The FRA 2010 data shows a decrease in global deforestation from 16 million ha/year in the 1990s to 13 million ha/year in the period 2000-2010. Part of this has been due to a significant reduction of the rate of loss of forests in Brazil, Indonesia and Sudan. However, many countries continue to have a high rate of loss of forests. Some of the loss was offset - in terms of area and (to some extent) carbon - through afforestation and natural expansion of forest unto abandoned agricultural land. As a result, the net change in forest area was -8.3 million ha/year in the 1990s and -5.2 million ha/year in the period 2000-2010. The lower deforestation rate and the establishment of new forests have helped to bring down the net carbon emissions from the global forest sector.

Most of large scale tree planting efforts are in China, India the USA and Vietnam, but the programmes in China, India and Vietnam, accounting for most of the recent gains in forest area, are scheduled to end by 2020. China has a national goal of increasing the forest area to 23% of the total land area by 2020. India aims to increase its forest area to 33% of the land area by 2012 and Viet Nam has a forest goal of 43% by 2010. Together, these three countries have been increasing their forest area by an average of 3.5 million hectares per year in the last ten years. If they stop planting at these high rates once their goals have been reached, the net loss rate will increase rapidly to the levels seen in the 1990s.

Source: Mette Loyche Wilkie (FAO), pers comm. 2010; and http://www.fao.org/news/story/en/item/40893/icode/

7   **Integrating reference levels between national and sub-national levels**: Once reference levels have been established at the national level, it is likely that they will need to be translated to sub-national levels (e.g. provinces or districts; or projects). Harmonisation will be a challenging task. This process will vary depending on countries' administrative structures.

Brazil has developed an approach for integrating reference levels between national and state levels, which sets state level targets that add up to the national target[11]. Indonesia has also developed regulations on this issue but it is still unclear how the relationships between project, regional and national reference levels will be managed, how crediting of sub-national activities will work, or how liabilities are divided up should Indonesia fail to meet its national reference level[12].

Key publications on this issue

Angelsen, A. (2008) 'REDD models and baselines', CIFOR, Bogor, Indonesia.

Angelsen, A. (2009a) 'Options for setting reference levels, In: Meridian (2009) 'REDD Options Assessment Report (REDD-OAR)'.

Angelsen, A. (Ed.) (2009b). Realising REDD+. National strategy and policy options. CIFOR, Bogor, Indonesia.

Busch, J. et al. (2009) 'Comparing climate and cost impacts of reference levels for reducing emissions from deforestation', Environ. Res. Lett. 4 (2009) 044006 (11pp).

Eliasch, J. (2008) 'Climate Change: Financing Global Forests. The Eliasch Review', The Office of Climate Change, London, U.K.

Griscom, B., Shoch, D., Cortez, R. And Virgilio, N. (2009) 'Sensitivity of amounts and distribution of tropical forest carbon credits depending on baseline rules', UNFCCC, Bonn, Germany.

Herold and Skutsch (2009) 'Measurement, reporting and verification for REDD+: objectives, capacities and institutions', In Angelsen, A. (Ed.) Realising REDD+. National strategy and policy options. CIFOR, Bogor, Indonesia.

OSIRIS model includes a public access spreadsheet tool that lets reference level options be explored: http://www.conservation.org/osiris/Pages/overview.aspx.

1   Herold and Skutsch 2009; Angelsen 2009

2   See Eliasch (2008) page 134 for a description of these different approaches. http://www.occ.gov.uk/activities/eliasch/Full_report_eliasch_review(1).pdf

3   Angelsen 2009b

4   Griscom et al (2009) found a range of over two orders of magnitude. Note that this study did not include modelling approaches.

5   Busch et al., 2009

6   In the 'Stock-Flow' approach, credits are allocated to countries as a function of both reduced emissions from deforestation (as compared with historical rate), and as dividends for maintaining carbon stocks (as a proportion of global forest carbon stocks).

7   Busch et al., 2009

8   Note that this approach is similar to the combined approach described in Table 11

9   Angelsen 2009a; Griscom 2009

10 Meridian, 2009

11 Lima, A. Stella, O. and Moutinho, P. 2009. 'Target, stock and deforestation reduction: a system proposal for financial benefit sharing from REDD in the Brazilian Amazon', IPAM, Brazil

12 Costenbader, J. (2009) 'Legal frameworks for REDD: Design and Implementation at the national level', IUCN, Geneva, Switzerland.