

Scientific and Technical Advisory Panel

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# Sustainable Forest Management: STAP Guidance on Implementing the new Work Program

**Paul Ferraro and Michael Stocking**



The Scientific and Technical Advisory Panel, administered by UNEP, advises the Global Environment Facility

## **Sustainable Forest Management in the GEF.**

### **Summary of Policy Guidance based on Scientific and Technical issues:**

- The new Sustainable Forest Management (SFM) Framework Strategy for GEF-4 is potentially innovative and challenging, requiring careful attention to scientific and technical issues in order to deliver global environmental benefits (GEB).
- SFM in the GEF needs to be defined precisely. GEF's contribution to land use change and forest conservation should be recognizably different from that of other agencies, focusing on GEBs, contributions of conservation to human development and other cross-cutting issues.
- Activities in land use and forestry (LULUCF) are one of the most effective means of off-setting emissions and increasing the removals of green-house gases (GHG). However, verification mechanisms are urgently required. Without verifiability, compensation and incentive systems will not work.
- The GEF has the need for a cost-effective, widely-applicable methodology that may be used by national and international stakeholders to measure the contributions of projects to changing carbon stocks.
- International compensation systems for reduced GHG emissions from deforestation and degradation (REDD) are problematic for the following reasons: the identification of the status of 'degradation'; the source of finance for making payments that ensure stability; the impact of 'cheap credits' on incentives in high-income countries to develop break-through technologies.
- Both REDD compensation systems and activities in LULUCF require the establishment of realistic and accessible baselines as well as the tracking of changes during the course of a project. Global-scale systems for establishing baselines urgently need development; local and national baselines need to be harmonized with the needs of GEF to show delivery of GEBs.
- The GEF may be the most appropriate financial mechanism for meeting the information and capacity needs to develop credible baselines and monitor changes.
- The new Strategic Program (SP2) of "Supporting SFM in Production Landscapes" requires innovative approaches that foster multiple land uses in whole landscapes, including forest margins and protected areas – 'the forest mosaic'.
- The GEF is advised to use SP2 as an opportunity to integrate multiple land uses over space and time, providing co-benefits for the global environment and local livelihoods.
- STAP offers its services to develop key issues such as the meaning of mainstreaming biodiversity in forest management; the development of sustainability criteria for biomass production from wood products; and the development of an evidence base for community-based sustainable forest management and other popular approaches to SFM.

## Background

1. The Sustainable Forest Management (SFM) Framework Strategy for GEF-4 is a new programmatic area for GEF investments. Building on the global objectives of the United Nations Forum on Forests (UNFF) and identifying elements of the Strategic Programs for Biodiversity (BD), Climate Change (CC) and Land Degradation (LD), the SFM Strategy presents a substantial scientific and technical challenge to build a distinctive program that reflects the overall goals of the GEF. To address this challenge, SFM needs to be defined precisely in the context of GEF financing. SFM's distinctiveness is built around the sustainable management of forests, forest resources and land that includes trees to deliver global environmental benefits (GEBs).

2. The GEF Council has approved two long-term strategic objectives for SFM: (1) the conservation and sustainable use of forest biodiversity; and (2) the promotion of sustainable management and use of forest resources. Sustainable forest management is the *means* to achieve these objectives, and not the objective itself<sup>1</sup>. These objectives are to be delivered through seven Strategic Programs for GEF-4, taken from the focal area strategies for BD, CC and LD.

3. The purpose of this paper is to advise on scientific and technical issues that should receive high priority in the development of activities in SFM. The advice is based upon a consultation amongst STAP members. It develops ideas for SFM already submitted by GEF agencies (e.g. FAO) and the UNFF Multi-Year Programmes of Work and Plan of Action (UNFF-6 and UNFF-7). This paper focuses on scientific issues that must be addressed, in the opinion of STAP, in order to deliver and to verify GEBs. There are a number of other issues in SFM that will require development by the GEF. STAP offers its services to consider these further. They include: the meaning of mainstreaming biodiversity in forest management; the development of sustainability criteria for biomass production from wood products; and the development of an evidence base for community-based sustainable forest management and other popular approaches to SFM.

4. Two Strategic Programs for SFM in GEF-4 especially require scientific input (SP3: Management of LULUCF as a Means to protect Carbon Stocks; SP7: SFM in Production Landscapes). These represent a substantial departure from standard forestry programs, and focus on topics that are themselves cross-cutting and innovative. A further Strategic Program also requiring scientific advice (SP6: Sustainable Energy from Biomass) is the subject of separate STAP studies and is not addressed here.

<sup>1</sup> STAP is concerned that this distinction in the SFM Framework Strategy of objective and means to achieve an objective be preserved. GEF cannot be the source of finance for standard activities in forestry that are the business of specialist forestry

## LULUCF and Issues of Measurement

5. Land Use, Land Use Change and Forestry (LULUCF) is the collective term to denote a focus of interest in bringing about the reduction in greenhouse gas (GHG) emissions through activities in terrestrial ecosystems, mainly in agricultural land use and forestry. Activities in LULUCF can be a relatively cost-effective way of off-setting emissions, either by changing land use activities to increase the removals of GHGs from the atmosphere or by reducing emissions by, for example, curbing deforestation. However, there are three main problems (1) attribution of change in GHGs or carbon stocks from an intervention – the incentive challenge; (2) authentication that the carbon would not have been sequestered without the intervention – the additionality challenge; and (3) the development and implementation of international compensation systems for reduced GHG emissions from deforestation and degradation (REDD) – the challenge of incentives. The IPCC argues that there is greater uncertainty in tracking GHG emissions associated with biological systems than those associated with energy and industrial systems.<sup>2</sup> This greater uncertainty, however, may be partially attributable to fewer investments in verification methods for biological systems. Without greater investment, verification will be difficult, and without verification, compensation and incentive systems will not work.

6. GEF-4 has set itself the objective of being able to measure the impact of project and portfolio investments. By measuring changes in baseline carbon conditions during the project period, the GEF will be able to discern progress towards its targets. However, calculating the net increase in carbon sequestration or the net reduction in GHG emissions as a result of GEF investments will be difficult because such changes cannot be directly observed. At both the project and portfolio level, the GEF will either have to make assumptions about net changes in the absence of its investments or will have to use carefully selected controls to represent net changes in the absence of its investments. Most projects will use assumptions, but the GEF should encourage a proportion of its projects to measure changes on comparable control sites, whenever feasible.

7. The SFM Framework Strategy for GEF-4 specifically includes the development of methodologies to measure carbon stores and GHGs emitted from LULUCF, and the accurate measurement and monitoring of the benefits of increased carbon sequestration in the forestry sector. Further, the Framework Strategy focuses on developing “an agreed-upon methodology to reliably measure carbon stored in standing forests ...[for] future GEF project proponents to quantify in a reliable and standardized way carbon as a global environmental benefit in forest-related projects.” Strategic Program 3 has an Outcome Indicator: “methodologies developed for carbon measurement”.

8. Estimating and monitoring changes in carbon stocks and GHGs brought about by anthropogenic activities at the project level involve a number of challenges that are not adequately covered by existing guidance for national inventories.<sup>3</sup> The IPCC recommends ‘higher-tier methods’ based on field measurement, or field measurement in combination with models. Soil carbon, the largest terrestrial sink for fixing GHGs, cannot be observed or easily measured in the same way that industrial emissions or above ground biomass in forests can be measured.

9. The principal problem with field measurement is the time, cost and access to field laboratories. The greater the variability in carbon stocks – an aspect likely to be increased with project investments – the greater the number of samples is needed to obtain accurate measurements. The cost of carbon

<sup>2</sup> Watson, R.T. et al. (eds.) 2006. IPCC Special Report on Land Use, Land Use Change and Forestry. UNEP and WMO. - [http://www.grida.no/climate/ipcc/land\\_use/index.htm](http://www.grida.no/climate/ipcc/land_use/index.htm)

<sup>3</sup> IPCC Good Practice Guidance for LULUCF, Section 4.3 - [http://www.ipcc-nggip.iges.or.jp/public/gpplulucf/gpplulucf\\_files/Chp4/](http://www.ipcc-nggip.iges.or.jp/public/gpplulucf/gpplulucf_files/Chp4/)

measurement varies according to project size, variability of C, required accuracy and confidence level, and frequency of measurement. Mean costs are in the range of US\$10-20 per sample.<sup>4</sup> A carbon-tracking tool that requires numerous samples to be taken over the lifetime of a project to verify global environmental benefits is not sustainable.

10. GEF requires a cost-effective, widely-applicable methodology that may be used by national and international stakeholders to measure the contributions of projects to changing carbon stocks. GEF has already invested in a soil organic carbon (GEF-SOC) modeling approach, testing it in Brazil, India, Jordan and Kenya, that requires limited sampling for calibration purposes and the use of desk-top computers running open-access modeling software.<sup>5</sup> The GEF is currently considering a number of proposals for developing its own methodology that will go well beyond soil carbon modeling to measure total system carbon as well as estimation of accrued GHG benefits. STAP recommends a hybrid measurement and modeling approach as being the most appropriate for GEF needs, being accessible at national level in both cost and demand for equipment. It should be adaptable to different needs in terms of absolute accuracy and intensity of sampling. It further recommends that developing this approach in SP3 of the SFM Strategy, alongside remote sensing-based tracking systems, is the best way forward for carbon measurement for all projects funded by GEF in natural resource management.

### LULUCF, REDD and Compensation Systems

11. GEF is centrally involved in the international debate about, and implementation of, international compensation systems for *reduced* GHG *emissions* from *deforestation* and *degradation* (REDD). Two of the most important issues with regard to a REDD compensation system are: (1) establishing baselines, and; (2). designing the institution that will facilitate payment transfers and monitoring (i.e., who is permitted to make payments and for what?). The most pressing issue, in STAP's opinion is the first, especially the importance of baselines and the tracking of changes during the course of the project.

12. Another issue, which is problematic and in need of more science, is the identification and measurement of the second "D" in REDD, 'degradation'. Partly, this is a question of definition. However, it is also a question of assessment and measurement. GEF has a current project, *Land Degradation Assessment in Drylands*, which is attempting to develop suitable assessment and tracking methods. However, for the time being, it is recommended that proxy measures, such as soil organic carbon, are used, partly because they are easier to measure and partly because they integrate a number of global environmental change aspects.

13. A fourth issue concerns the proposals from a number of countries (e.g. Costa Rica) with high forest cover and low deforestation rates for a "Stabilization Fund" that rewards nations who have done well in reducing deforestation. Proponents argued that such a fund will reduce leakage in a REDD compensation system that pays nations with high deforestation rates. A key issue in such proposals is who is going to pay for stabilization when there is no clear connection to emissions markets. GEF should consider whether this is an appropriate activity through its biodiversity portfolio. The incremental cost arguments are unclear and need further analysis.

<sup>4</sup> One of the most detailed cost estimates for measuring carbon gave a mean cost per sample of \$16.37, including field and laboratory costs – see Mooney, S et al., 2004. Soil Carbon Sequestration in Agriculture: How much could it cost to measure soil carbon in Montana? - <http://www.montana.edu/wwwpb/pubs/mt200409.html>

<sup>5</sup> See: Easter, M. et al 2007. The GEFSOC soil carbon modeling system: a tool for conducting regional-scale soil carbon inventories and assessing the impacts of land use change on soil carbon. *Agriculture, Ecosystems and Environment* 122: 13-25

14. An additional concern is that allowing high-income nations to offset their emissions with cheap credits from developing nations under a REDD compensation system would reduce the incentives in high-income nations to develop break-through technologies for reducing and sequestering emissions more efficiently. Thus, if the REDD system were popular among high-income nation polluters, the desire to facilitate environmental gains in developing nations could lead in the long-run to lower aggregate global environmental benefits. Given GEF's primary concern of contributing to the incremental costs of developing nations, the GEF should consider the likely demand within a REDD system and the potential for perverse consequences.

### **LULUCF and establishing baselines**

15. Global climate policy initiatives are now being proposed to compensate developing nations for *reducing carbon emissions from deforestation and degradation (REDD)*. These initiatives have the potential to include developing countries more actively in international greenhouse gas mitigation and to address an important source of carbon emissions: deforestation. However, an international system that permits compensation to developing countries for REDD requires a baseline; or, a point of reference for determining the magnitude of the reductions.

16. The determination of appropriate baseline must meet stakeholder needs. They are, therefore, scale-dependent. Local baselines may often be determined by participatory surveys in, for example, in initiating a Clean Development Mechanism for a specified community.<sup>6</sup> National-level baselines for forests, while meeting internationally-defined standards, should not only reflect carbon stocks in applicable pools in vegetation and soil, but also projected land use change.<sup>7</sup> The proposed Forest Carbon Partnership Facility has developed a suite of activities related to the opportunity cost of land, starting with control of forest fires and eventually, if economically viable, prevention of conversion of land use.<sup>8</sup> Global-scale systems for developing appropriate baselines are yet to be developed. They should start with forests, building on and improving current assessments, such as those managed by the FAO.<sup>9</sup>

17. Baselines must be credible, defensible, and verifiable. They must focus on measuring real emission reductions. Despite the uncertainty associated with establishing such baselines, the international community and individual countries need to begin to lay the groundwork for baseline-setting protocols. Such baselines are an essential precursor to an international REDD compensation program.

18. Determining where the responsibility lies for developing such protocols is an issue that must be addressed first. The quality of data and human capacity varies across nations and thus a centralized, inter-governmental effort to develop baselines for each country may be necessary. Such an effort could be funded by the GEF under the auspices of the UNFCCC and could be based on a single data foundation with a time series of global coverage, such as Landsat imagery. A coordinated inter-governmental effort is more likely to be transparent, to ensure consistency across nations, and to take advantage of economies of scale in data accumulation and analysis in comparison to an approach that depends on each nation defining their own baselines.

<sup>6</sup> See, for example: Potvin, C. et al 2007. A participatory approach to the establishment of a baseline scenario for a reforestation Clean Development Mechanism project. *Mitigation and Adaptation Strategies for Global Change* 12: 1341-1362.

<sup>7</sup> Brown, S. et al 2007. Baselines for land-use change in the tropics: Application to avoided deforestation projects. *Mitigation and Adaptation Strategies for Global Change* 12: 1001-1026.

<sup>8</sup> See: Kapoor, K. and Ambrosi, P. 2007. *State and Trends of the Carbon Market 2007*. The World Bank, Washington DC. – [www.carbonfinance.org](http://www.carbonfinance.org)

<sup>9</sup> *Global Forest Resources Assessment 2000*. FAO Forestry Paper 140, UN Food and Agriculture Organization, Rome.

19. Alternatively, it could be argued that a centralized approach impinges on sovereignty and fails to use (or develop) local human capacity. Thus, an alternative would be to create a set of international standards to which each nation's self-defined baseline would be judged (akin to <http://www.ipcc-nggip.iges.or.jp/public/gpplulucf/gpplulucf.htm> ).

20. Regardless of where the responsibility lies, establishing credible baselines is likely to suffer from limited funding, data and expertise in most developing countries. The GEF may be the most appropriate financial mechanism for filling this information and capacity gap in order to develop credible baselines. In particular, the development of a common standard-based, high-quality, global database of land cover is required to implement a REDD compensation system. Such a database is a global public environmental good that will generate large impacts from a modest investment.

21. While GEF should not become directly involved in private markets or the certification of standards, GEF could facilitate third-party (e.g. NGO) involvement in the development and implementation of a compensation system for REDD because the market participants do not necessarily have the appropriate incentives to ensure the provision of GEBs. Unlike markets for private goods, neither side of the market for reduced emissions from deforestation and degradation has an incentive to ensure the underlying quality of the traded good - a general problem in all constructed markets for environmental goods and services. The developing nation (or landowner in such a nation) simply wants to sell a credit and the buyer simply wants to buy a certified credit. Neither side really cares about the carbon emissions beyond the certification process (i.e., if it "counts," it's good). Thus third-parties, such as NGOs, are critical to the functioning of these markets. In national systems such as the US market for sulphur dioxide permits, the national government plays the watchdog. It should be asked, who will play the watchdog role for an international system of compensation for REDD. GEF needs to consider this issue urgently.

### **Trees in the production landscape**

22. One of the new strategic foci for Sustainable Forest Management in GEF-4 is Land Degradation Strategic Program 2 (SP2): "Supporting Sustainable Forest Management in Production Landscapes". The focus on 'production landscapes' is part of the developing discourse in biodiversity conservation<sup>10</sup> that seeks to bridge the growing divide between proponents of community-based approaches to conservation (such as CBNRM) and those advocating a return to more traditional preservationist approaches to biodiversity conservation. The SP2 is intended to complement the GEF's existing strategies through fostering diversity at a landscape level. This diversity underwrites global environmental benefits in biodiversity conservation and in land degradation control. Diversity especially includes 'agrodiversity' as defined by the UNU-UNEP-GEF project *People, Land Management and Environmental Change* (PLEC),<sup>11</sup> which encompasses diversity in soil management, species, habitats, organization of land use and human interactions with the environment.

23. Trees are one component of this diversity, but often not the most important. PLEC demonstrated and successfully argued that global environmental benefits in conservation of biodiversity and land degradation control cannot be achieved without addressing the linked benefits of biodiversity supporting livelihoods and livelihoods supporting biodiversity. This arises through the actions of the immediate guardians of biodiversity, the land users, and their priorities, which may not include trees. Land users' decisions must be

<sup>10</sup> See, for example, the account of how changing narratives with regard to biodiversity conservation have affected conservation and natural resource management, livelihood strategies and political processes: Hutton, J. et al. 2005. Back to the barriers: changing narratives in biodiversity conservation. *Forum for Development Studies* 32: 341-370.

<sup>11</sup> Agrodiversity has been defined as "the many ways in which farmers use the natural diversity of the environment for production, including their choices of crops and their management of land, water and biota" (Brookfield, H et al 2002. *Cultivating Biodiversity: Understanding, analyzing and using agricultural diversity*. UNU Press, Tokyo, p.9

the primary means of achieving GEBs in non-PA land uses – i.e. the vast majority of landscapes, the production landscapes.

24. The Land Degradation focal area strategy specifically excludes actions related to forestry that involve production forestry, forest management, protection of closed forest and agroforestry on the grounds that these are already adequately catered for by other organizations and funding bodies and other focal areas of GEF. 'Trees and/or forestry in the production landscape' is different in concept and practice to either 'forest management' as generally promoted by forest agencies or agro-forestry as promoted by ICRAF. Agro-forestry, for example, is usually defined in terms of mixing types of land use, including trees, in order to derive specific production and livelihood benefits. The 'production landscape' may indeed involve these technical aspects of forestry and social forestry but it sets them into a far broader context, such as:

- the enabling policy and institutional environment that fosters multiple land uses within whole landscapes;
- the forest margins and actions to address the processes of forest fragmentation as a means of reducing further degradation of forest and woodlands
- an emphasis, where appropriate, on multi-purpose land use activities that trade-off benefits for both the environment and livelihoods under scenarios of climate change – cropland, grazing, harvesting of fuelwood and non-timber forest products and silviculture
- promotion of practices in the land use 'matrix' that meet human needs in production of food, fuel and fiber, that are sufficiently 'biodiversity-friendly' to provide connectivity and additional habitat for threatened species

The GEF's area of advantage as implied in the term 'production landscape' should, therefore, be in using the processes of sustainable forest management in these broader contexts to deliver major beneficial impacts for the global environment.

25. 'Landscape' is, therefore, an important guiding concept. In its immediate definition it involves "a portion of land or territory which the eye can comprehend in a single view." However, for GEF it is conceptually the analogue of ecosystems for biodiversity in protected areas; in other words, landscapes provide for integration of many globally-significant attributes in soils, plants, trees, water in areas of land use, while simultaneously providing for benefits for local people and for mainstreaming beneficial change into policy and practice. This is the underlying rationale of Strategic Program 2 of the SFM for GEF-4 financing. An initial review of proposals for GEF-4 under this SP suggests that this is not well understood by GEF agencies.

26. GEF and its agencies are also advised to use the SP of 'trees in the productive landscape' as an opportunity to integrate multiple land uses over space and time, providing co-benefits for the global environment and local livelihoods. There is considerable opportunity for innovative approaches that use local knowledge in scientifically-valid contexts to build enabling environments to deliver GEBs across whole landscapes and areas of land use.