BioCarbon Fund
Initiative for Sustainable Forest Landscapes

ISFL Methodology Workshop Summary

January 26-27, 2016

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1. Background

The BioCarbon Fund Initiative for Sustainable Forest Landscapes (ISFL) seeks to promote reduced greenhouse gas emissions from land-use. The Initiative will support reducing deforestation and forest degradation in developing countries (REDD+), increasing sustainable agriculture, and smarter land-use planning, policies and practices. The ISFL is currently operating in Colombia, Ethiopia, Indonesia, and Zambia. Contributors to the ISFL include Germany, Norway, the United Kingdom, and the United States of America.

In order to meet its objective, the Initiative will deploy results-based finance to incentivize changes at the jurisdictional level. With this, the Initiative builds on a growing consensus for the need for broad scale greenhouse gas accounting of emission reductions from land-use, both in terms of spatial scale and comprehensiveness. In practice, this usually means accounting emission reductions within a jurisdictional landscape where a mosaic of forestry, agriculture, and other land uses exists.

Although Intergovernmental Panel on Climate Change (IPCC) methods that allow for comprehensive national reporting of greenhouse gas emissions from the land-use sector exist, further work might be required to develop approaches to account for emission reductions with sufficient confidence to allow for result-based payments. The ISFL therefore seeks to develop such a methodological approach.

2. Introduction to the BioCF ISFL

Existing international mechanisms that address greenhouse gas (GHG) emissions from land use by providing results-based payments, have traditionally resulted in somewhat disconnected pilots at a relatively small scale. Although many of these pilots were successful and generated lessons, there is now a demand to employ results-based climate finance to promote landscape-level transformations that deliver increased productivity, improved livelihoods, enhanced local environmental performance, and large-scale carbon sequestration.

This progression is also on-going in the World Bank's BioCarbon Fund (BioCF). The first two tranches of the BioCF piloted over 20 projects in multiple countries. On average, these projects implemented reforestation or sustainable agriculture practices on between 5,000 and 30,000 hectares. As part of these pilot projects, the BioCF pioneered and tested multiple carbon accounting methodologies, including for Afforestation/Reforestation, REDD+ and sustainable agricultural landscape management.

The BioCF ISFL is the third tranche of the BioCF and reflects the demand for progression from relatively small-scale pilot projects to a program aimed at incentivizing sustainable land use on a landscape scale. Specifically, the ISFL builds on the BioCF tranche one and two experiences in attempting to blend climate and development impacts through the alignment of public and private sector interests.

The ISFL has four key design elements, including:

- A lean and locally-relevant governance structure and execution
- Development of innovative public-private partnerships
- Integrated large-scale landscape-level design

- Results-based financing with carbon as a metric of performance

An integrated landscape-level design requires working at an appropriate jurisdictional level, such as a state or district within a country. Once the landscape is delineated, the ISFL designs programs that focus on an integrated approach to the entire landscape with the ultimate goal of reducing greenhouse gas emissions and producing co-benefits such as improvements to livelihoods or agricultural productivity. This integrated approach catalyzes synergies between activities within a single area. For example, an ISFL program could coordinate efforts in sustainable agricultural production projects, agro-forestry schemes, assisted natural regeneration, energy projects, water management, and REDD+ to align objectives and maximize impacts in the jurisdiction.

Ultimately, jurisdictions that implement these measures are expected to generate emission reductions that can be purchased through a results-based financing mechanism. To match the ambition of the integrated landscape-level design, the ISFL will also attempt to account for greenhouse gas emissions from the variety of land uses in a jurisdiction. The ISFL therefore seeks to develop a methodological approach that will allow for results-based payments from comprehensive accounting of greenhouse gas emissions from the whole land-use sector.

3. Workshop summary

To start the development of its methodological approach, the ISFL hosted a workshop at the World Bank headquarters on January 26-27, 2016. The workshop brought together representatives of the ISFL Contributors and an international group of experts to take stock of the latest thinking on issues related to comprehensive accounting and to discuss priority issues that need to be addressed as part of this methodological approach, which include:

- The appropriate scope for comprehensive accounting of emission reductions from land use in terms of significant pools, gases, sinks and sources;
- Possible acceptable approaches for setting a comprehensive, landscape Reference Emission Level (REL) based on available data; and
- Cost effective approaches for monitoring which would still allow for an acceptable level of accuracy and are in-line with developing United Nations Framework Convention on Climate Change (UNFCCC) reporting and accounting approaches.

3.1 Concepts and scope for comprehensive landscape accounting

(see Annex 1 for presentation)

The Paris Agreement recognizes that good practice methodologies accepted by the Intergovernmental Panel on Climate Change are the basis for national inventories and future reporting under this Agreement. The ISFL seeks to build on this, but recognizing that further work might be required to develop a methodological approach to account for emission reductions with sufficient confidence to allow for result-based payments.

This session therefore focused on the following questions:

- Should the ISFL strive for a fully comprehensive approach (recognizing that big differences in data quality exists between different land uses and different countries) or should the fund focus on a minimum set of land-uses with a high standard for data quality?
- If the latter, what are the minimum requirements to still be considered as comprehensive enough for the purpose of the ISFL?
- Can ISFL program countries manage this type of methodological approach?

The presentation discussed the following concepts from the IPCC good practice guidance as a starting point for better understanding the questions outlined above:

- **Land-use categories:** IPCC distinguishes six land-use categories but countries may choose to further stratify land in each category by climatic or other ecological regions, depending on the choice of the method and its requirements.
- **Pools:** Greenhouse gas emissions and removals are determined for each specific land use all pools, as well as non-CO2 emissions from burning and, depending on the land-use category, emissions from other specific sources (e.g. methane (CH4) emissions from rice). IPCC also recommends that CH4 and nitrous oxide (N2O) emissions from livestock management are estimated for major animal types.
- **Key categories analysis**: IPCC determines key categories that are prioritized because the estimate of each key category has a significant influence on the total inventory of greenhouse gases in terms of the absolute level, the trend, or the uncertainty in emissions and removals. It is good practice to select more detailed higher tier methods for key categories.
- **Managed land vs unmanaged land**: IPCC recommends reporting on all emissions by sources and removals by sinks from managed lands, which are considered to be anthropogenic. Carbon stock estimates should be recalculated for the complete inventory time-series area whenever the total area of managed land changes in an annual inventory.

Discussion

- Most participants encouraged starting with the full inventories based on the national GHG reporting and IPCC guidelines, rather than generating a new methodological approach as it could duplicate work for ISFL program countries that are already reporting within these guidelines. The ISFL can serve to encourage an improvement in data availability and quality over the lifetime of the initiative through a variety of incentives. In doing so, inventories and reporting could be improved and potentially scaled up to the national scale, which could ensure the sustainability of this approach going forward.
- At this point, it appears that the ISFL will need to develop a methodological approach that is somewhat flexible to reflect differences in each ISFL program. When purchasing emission reductions from each country and it will therefore need to consider if the fund strives for high consistency or if the emission reductions being purchased could differ. If the emission reductions are allowed to differ, this could be managed through for example volume discounts or price differentiation.

- Improvements to systems could reduce the volume of emission reductions available for purchase because data would be more accurate. The ISFL should consider ways to balance this potential inverse relationship through its methodological approach.
- The experiences of the participants indicate that countries prefer to use existing data sets to account for emission reductions. Utilizing these data sets, even if of lesser quality, can help to ensure countries adopt a proposed methodological approach and sustain its use in the future.
- An integrated framework that accounts for emission reductions could be developed to ensure each country can use their various data sets. This type of framework would allow for comparisons between data sets and could serve to ultimately reduce uncertainty.
- Costs and feasibility should be considered when creating standards for data quality or determining which land uses should be reported on.

3.2 Candidate approaches for determining comprehensive RELs

In the context of REDD+, Reference Emission Levels (RELs) take into account historic data, and adjust for national circumstances. For historic data, countries mostly rely on the use of archived remote sensing images to determine activity data. When considering a REL for comprehensive accounting, it is unclear if the same approach can be used. This session therefore focused on the following questions for thinking about a REL for comprehensive accounting:

1. Is there a time series of activity data that would allow for calculation of historic emissions?
2. What are options for using models to develop forward looking emission scenarios or maybe even historic emissions?
3. Should we consider shorter reference periods or maybe even a base year?

3.2.1 Historic data availability for landscape RELs

(see Annex 2 for presentation)

This presentation highlighted two parameters that are essential for accounting for a carbon stock: area and carbon density. Based on an example from Cameroon, the presentation discussed that determining the boundary of the measurement area can be complicated given that there are fluxes across jurisdictional delineations. Furthermore, data for carbon density of various land uses can be difficult to determine given that data sources can be scarce, fragmented, or incomplete.

Discussion

- An understanding of data availability and quality in-country would be useful to determine the appropriate approach for the ISFL. If data is unavailable or of poor quality, a step-wise approach to ensure quality standards are satisfied could be considered.
- The use of proxies could be considered as long as there is reliable area and density data. This may be difficult at the landscape level, especially because emission reductions come from differences in management practices rather than just a change in land use. Tracking changes in management practices would require verification on the ground to ensure the data's reliability. BioCF tranches one and two piloted methodologies that measured changes from traditional management practices to sustainable agriculture. This required using a base year as a REL.

3.2.2 Use of models to determine RELs

Potential of using carbon accounting models for RELs
(see Annex 3 for presentation)

This presentation introduced Canada's National Forest Carbon Monitoring, Accounting & Reporting System and how it is used to report past carbon dynamics, project future carbon dynamics and develop climate mitigation and adaptation strategies. It further highlighted the steps that Canada and Australia are undertaking to develop the next generation of tools that provides more ownership and control to countries. An example of such a next-generation tool is the System for Land-based Emissions Estimation in Kenya (SLEEK) data platform being developed which represents a first attempt to account for all lands in a single system and simulation (Tier 3, Approach 3).

Potential for the use of economic spatial analysis for RELs
(see Annex 4 for presentation)

This presentation gave examples of how economic models can be used as a decision support tool to evaluate the impact of policy reforms and activities on the economy, emissions and sequestration trends while accounting for all land uses (landscape approach). The approach presented combines three types of economic spatial analysis that could be useful in informing RELs:

- The International Model for Policy Analysis of Agricultural Commodities and Trade (IMPACT): combines projections for agricultural commodities such as gross domestic product (GDP), climate change, and changes in diets to identify potential trends and future scenarios
- A Land use model utilizing satellite images and/or census data.
- A Crop model that is a process-based model that analyzes how crops are grown.

The use of these types of econometric models could be useful since the past may not be a good predictor for future trends and behaviors. Rather this approach tries to connect to and be consistent with economic theory.

Discussion
There is potential for combining a carbon accounting model with an economic spatial analysis for providing additional context for activity data, which could in turn be consistent with national inventories.

- The majority of participants had a sense that it was best to explore what historical data was available in each ISFL program country because this is the traditional basis for RELs. However, if this is not feasible, other approaches and models could be considered.
- There is a distinction between an approach for setting an REL and the tools used to measure it. The decision for an approach to RELs should be made depending on the set of activities in a landscape and land use choices. Once this is established, a tool could be chosen to reach this objective.

3.3 Monitoring, Reporting, and Verification (MRV)

Comprehensive monitoring of emission reductions in a landscape needs to balance the costs of collecting data and the need for showing results with sufficient confidence to allow for results-based payments. This session focused on the following questions for thinking about MRV in the context of comprehensive accounting:

1. What kind of data can be easily collected through remote sensing or in the field?
2. How can those data be used to calculate emissions?
3. How does this compare to the approaches for the REL in order to calculate emission reductions?

3.3.1 Remote sensing approaches for comprehensive monitoring of emissions from land-use

(see Annex 5 for presentation)

This presentation gave an example of a "direct" approach to quantify changes in carbon density over time and space using a combination or remote sensing techniques and multiple annual observations. This approach could be globally consistent and continuous without a need to classify forest and land cover change. These types of biomass density maps would provide average numbers for different parts of a landscape and can help in regions with few field data.

Discussion

- Integrated frameworks using this type of remote sensing approaches in combination with models and filed observations could be used to 'stitch together' knowledge pools for estimates of emissions and removals. In addition, data on carbon stock pools could be used to better parameterize a model, ultimately improving the data quality of other pools.
- Remote sensing is less useful for understanding fluxes in soil carbon pools, and field data will be required to investigate this pool. However, soil carbon is relatively stable until a land cover change takes place and this change could be captured by remote sensing. Therefore, the combination of remote sensing and field data should be considered when measuring emissions from land-use.
- Uncertainty in remote sensing is mostly related to the pixel size used for analysis. However, as the landscape area increases trends begin to converge, ultimately reducing uncertainty.
- There is a lack of uptake of this approach in-country, which could be a consideration for the ISFL in developing an MRV system because it may ultimately be unsustainable. However, field data could be generated by the country and used to validate the remote sensing analysis, which could promote in-country ownership of this approach.
- A convergence between land use and land cover categories should be considered to ensure remote sensing data adds value to IPCC approaches. It was suggested that land use categories be assigned once land cover analysis has been done to reduce the chance of compounding uncertainty.

3.3.2 Activity based models for comprehensive monitoring of emissions from land-use

(see Annex 6 for presentation)

This presentation provided an introduction to the Sustainable Agricultural Land Management Methodology (SALM) that was developed in the past by the BioCF for project level interventions under the Verified Carbon Standard (VCS). This methodology uses a model-based approach that takes into account agricultural activities in quantifying changes in soil carbon, rather than directly measuring soil carbon. It relies on a bottom-up monitoring framework, using farmer/community monitoring of sustainable agriculture practices. With some adaptation, this methodology can be broadened to consider models that cover a broad range of agricultural practices. The current approach is low cost, but requires support to establish community (farmer) based monitoring systems in the initial years.

Discussion

- This project was implemented with an existing farmer group that works collectively on feed procurement, savings and loans, etc. Therefore, they are accustomed to working together to maximize their benefits.
- Farmers were compensated based on performance in key categories such as adoption rate, how many practices were adopted, etc. The key incentive for farmers to continue with these practices are the increased crop yields that they observe.
- The methodology is being used in a project that is being implemented in the same jurisdiction as the ISFL Zambia program. As part of the project, a local nongovernmental organization (NGO) pays a price premium for sustainably produced commodities which are then sold in local markets. This methodology highlighted weaknesses in the approach being utilized by the NGO, which has improved the program and presents opportunities for scaling these efforts up to ministries or state agencies.

4. Takeaways and next steps

Overall, the workshop participants encouraged the ISFL to align with IPCC inventories wherever possible to minimize duplication and inputs required by the ISFL program countries. At the same time, the workshop stressed that the methodological approach for the ISFL should be balanced, pragmatic and doable for a country.

In order to determine which land use categories and the quality threshold required for data on significant sources and pools, an assessment of data availability and quality in each country is required. Furthermore, country ownership of data sources is key for ensuring adoption and sustainability of a methodological approach.

Despite these unknowns, there was consensus that the ISFL would likely take different approaches to accounting for emission reductions in each program country given differences in landscapes. However, a certain level of detail may be required for an overarching ISFL approach to ensure environmental integrity of emission reduction calculations.

Finally, most participants requested that the ISFL strongly consider cost and time effectiveness of a comprehensive landscape methodological approach. In order to ensure ISFL program countries are able

to adopt an approach and sustain its implementation beyond the lifetime of the ISFL, a step-wise approach could be considered.

Next steps

The ISFL will produce two documents that will support future discussions on the development of a comprehensive landscape methodological approach:

1. An analysis of available relevant data in ISFL program countries. As part of this analysis, an understanding of the quality of data sets will also be ascertained.
2. A description of the IPCC guidelines to ensure that contributors to the ISFL methodological approach have a common understanding of the IPCC.