

Planning Guide



Integrating REDD+ accounting within a nested approach

USAID Lowering Emissions in Asia's Forests (USAID LEAF)

Planning Guide

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ABBREVIATIONS & ACRONYMS

ACR	American Carbon Registry
ATREDD+	REDD+ early action areas (in Mexico)
CLiPAD	Climate Protection through Avoided Deforestation
DRC	Democratic Republic of Congo
ER	Emission reductions
ER-PIN	Emission Reductions Program Idea Notes
ERPA	Emissions Reduction Purchase Agreement
FCPF	Forest Carbon Partnership Facility
GHG	Greenhouse Gas
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit (German International Cooperation)
IPCC	Intergovernmental Panel on Climate Change
JICA	Japan International Cooperation Agency
JNR	Jurisdictional and Nested REDD+ (VCS)
MARD	Ministry of Agriculture and Rural Development (in Vietnam)
MECNT	Ministry of the Environment, Conservation of Nature and Tourism (in DRC)
MRV	Measurement, Reporting and Verification
NFI	National Forest Inventory
NFMS	National forest monitoring system
NGO	Non-governmental Organization
REDD+	Reducing Emissions from Deforestation and Forest Degradation sustainable management of forests, conservation of forest carbon stocks and enhancement of carbon stocks
RL, REL	Reference level; reference emissions level
UN-REDD	United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries
UNFCCC	United Nations Framework Convention on Climate Change
USAID	United States Agency for International Development
USAID LEAF	United States Agency for International Development Lowering Emissions in Asia's Forests (USAID funded program)
VCS	Verified Carbon Standard
VCU	Verified Carbon Unit
VNFOREST	Vietnam Forest Administration

GLOSSARY

Emission factors – The average emission rate of a given greenhouse gas (GHG) for a given source, relative to units of human activity resulting in emissions or removals taking place during a given period of time.

Emission reductions (ER) – Reductions of greenhouse gas emissions produced by the implementation of a REDD+ strategy or other activities, representing the difference between baseline or reference level emissions and actual emissions, once leakage has been accounted for; and once monitored, reportable as a unit for carbon finance payments.

Jurisdiction – An area over which authority is exercised, e.g., a defined administrative unit such as a nation, state, province, region, municipality, department, canton or district. The term has also been applied to eco-regions and other ecologically or geographically defined areas which could form administrative units for REDD+.

Leakage – The displacement of GHG emissions from one geographic region to another as a result of the activities or interventions of a project or jurisdiction.

Measuring, Reporting and Verification (MRV) – A national and/or subnational set of processes to robustly authenticate GHG emissions. MRV systems allow for a determination of GHG emission reductions, avoided emissions and/or removals compared to the reference level. They can also be used to monitor safeguards, governance, and multiple benefits from REDD+ activities.

Nesting – The process of integrating and reconciling the carbon accounting of national, subnational and project level REDD+ activities.

Non-permanence – The concept of keeping and avoiding the reversal of avoided or sequestered emissions stored in woody biomass indefinitely, or for a given period.

Reference Levels (RLs) and Reference Emissions Levels (RELs) – Under the UNFCCC, RELs and RLs are defined as “benchmarks for assessing each country’s performance”¹ in implementing REDD+ activities, expressed in tonnes of carbon dioxide equivalent per year. RELs are generally understood to refer to an estimation of GHG emissions from deforestation or forest degradation (gross emissions), whereas a RL includes both GHG emissions and activities that enhance forest carbon stocks (net emissions). This report refers to RLs, since this term encompasses all of the activities included in RELs.

Reversal – A situation in which emissions exceed the RL or baseline during any given monitoring period. Sometimes used to refer to the re-emission of sequestered carbon in biomass or soils.

REDD+ – Reduced Emissions from Deforestation and forest Degradation and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries.

¹ Decision 12/CP.17, para. 7.

EXECUTIVE SUMMARY

In many countries subnational and project-level REDD+ activities are being established to fulfill different aims. These aims include building capacity for REDD+ implementation of early emission reductions and removals in jurisdictions (defined administrative areas), meeting requirements for REDD+ initiative funding, or to allocating national climate policy commitments to subnational jurisdictions. These subnational and project-level activities may prove to be pilot or demonstration activities that are eventually subsumed into an emerging national REDD+ approach. However, some countries may choose to pursue REDD+ in the long term as a series of subnational interventions, which retain independence but in sum constitute the national approach.

Whatever the path taken, a process of integrating subnational and project carbon accounting into a national carbon accounting system will be required. Otherwise, forest monitoring systems would be generating different data using different methods from those proposed for the national forest monitoring system, potentially with different reference levels. The process of creating a methodological and programmatic approach for harmonizing or integrating REDD+ projects and subnational efforts into the national system is commonly referred to as “*nesting*” or following a “*nested approach*” (Pedroni et al., 2009).

Given the complexity and the variety of circumstances that countries face, and rapidly evolving international and national climate policy, programs and funding vehicles, a consensus approach to designing an integrated accounting system has not yet coalesced. Few precedents exist for how an integrated accounting system should be structured. Because of this and the complexity of existing and planned accounting systems, it may not be possible to define an exact outcome at the beginning of the process.

More important is cataloging the challenges that will need to be tackled, and creating an agreed process for integrating (or ‘nesting’) the different carbon accounting systems, so that

- there is consistency in how emissions and emissions reductions are measured within projects and programs within a country,
- payments based on performance can be fairly allocated to those who have earned them,
- economies of scale can be achieved through shared use of measuring, monitoring and reporting systems, and
- any level of REDD+ program development can integrate one level of activity below it, in terms of jurisdiction or project.

Communities, developers, donors and investors need confidence that there is a structure of accounting, monitoring and reporting systems that will be able to transparently and consistently determine the emissions reductions achieved by their efforts.

Three broad approaches to nesting are identified and summarized in the figure below:

1. a subnational/project-led approach,

2. a flexible national approach, and
3. a strong national approach.

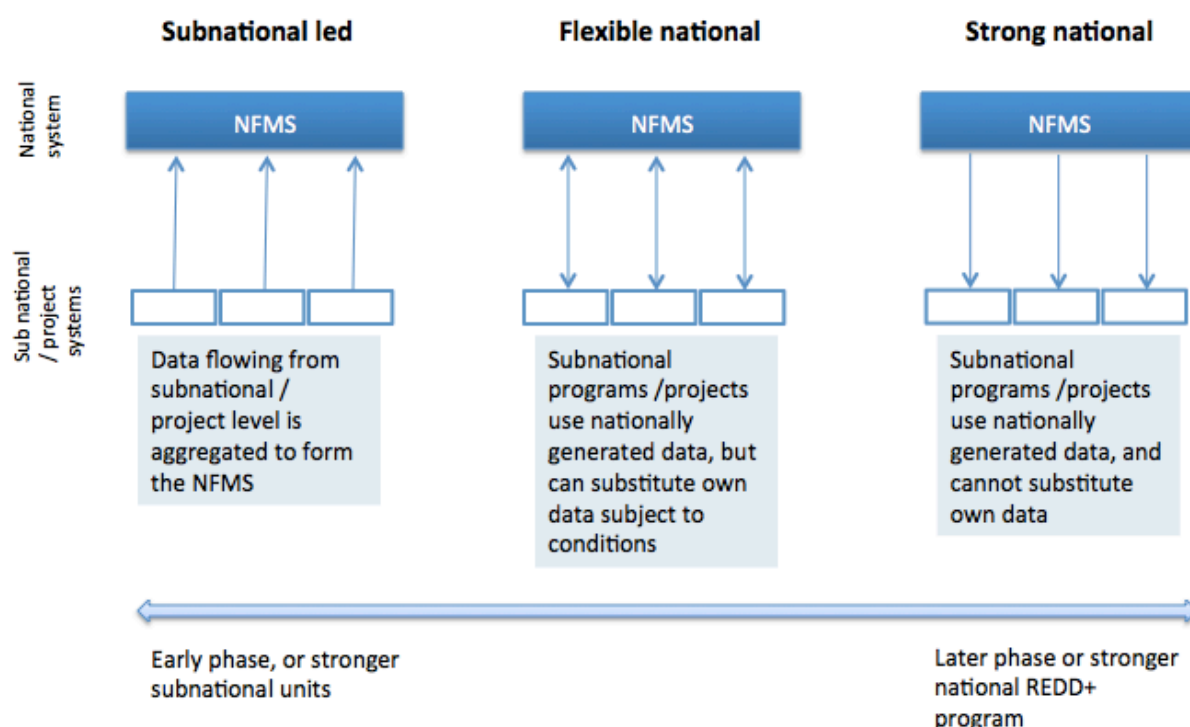


Figure ES-1: Alternate approaches to REDD+ national and subnational accounting, using the example of the national forest monitoring system (NFMS).

In practice, the approach selected is likely to fall somewhere along a gradient across these definitions, and a country could blend approaches. For example, a country could take a strong national approach to accounting for avoided deforestation, requiring use of its NFMS land cover change data, forest definitions, and monitoring results, but allow subnationally led afforestation accounting where the NFMS does not adequately report it.

In this planning guide we present a stepwise framework for identifying and addressing the challenges associated with developing an integrated carbon accounting framework, as shown below.

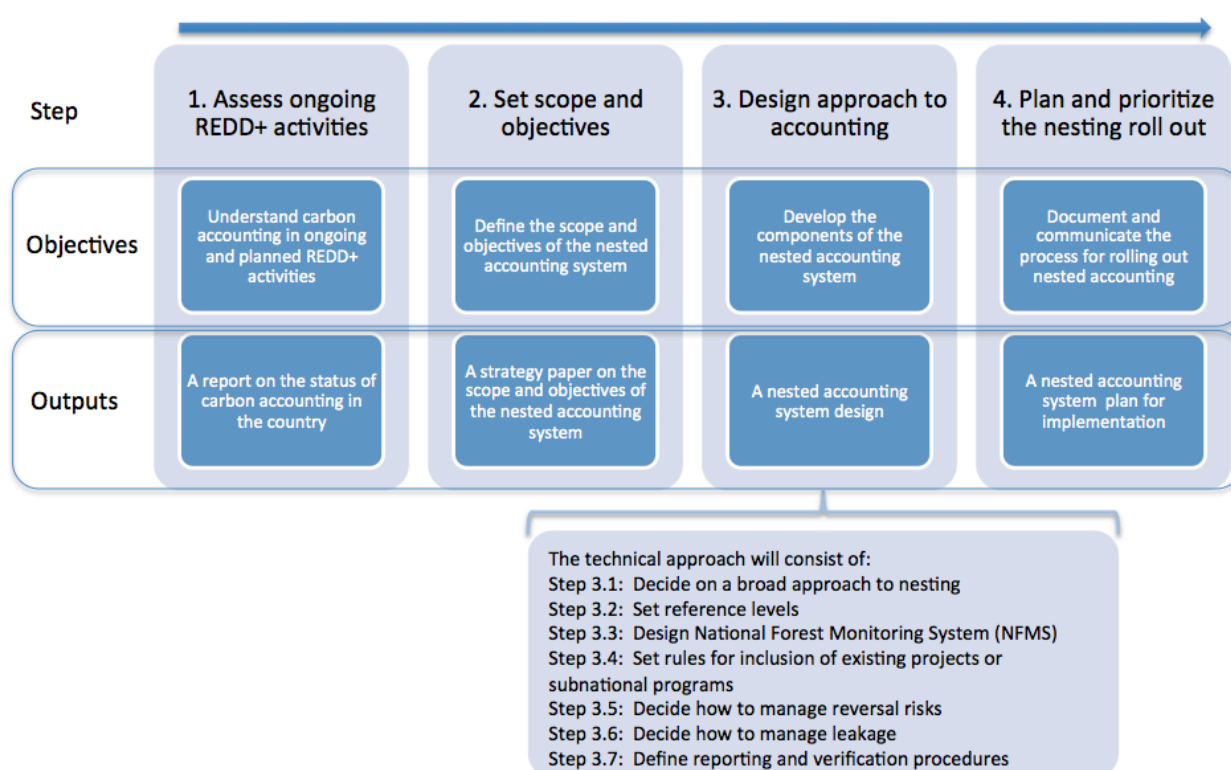


Figure ES-2: Steps to integrate subnational programs and projects into a national integrated carbon accounting framework

Performing an assessment of existing REDD+ programs and methodological work is an important early step. Table ES-1 summarizes important questions to guide this assessment.

Table ES-1: Representative questions to answer during an assessment of ongoing REDD+ activities (excerpted from full table in text)

Technical component	Representative questions to answer in relation to subnational programs and projects (excerpts)
REDD+ Activity Scope	
Activity and spatial scope	<ul style="list-style-type: none"> What REDD+ activity types are being implemented in existing or anticipated subnational REDD+ programs and projects in the country? What are the spatial boundaries of existing subnational programs and projects, including leakage areas?
Pools and gases	<ul style="list-style-type: none"> What pools and gases are included in ongoing projects and activities?
National Forest Monitoring System	
Carbon stocks and emissions factors	<ul style="list-style-type: none"> What methods have been used to estimate carbon stocks of land cover strata at national, subnational and project levels, and growth and degradation over time?
Reference levels	
Setting reference levels	<ul style="list-style-type: none"> Over what area have reference levels been set? Are the reference levels spatially explicit?
Reversals and leakage	
Reversals and buffer systems	<ul style="list-style-type: none"> What systems are being used to cover the risk of reversals within the country?
Leakage allocation	<ul style="list-style-type: none"> What systems are in place for tracking leakage in subnational programs and projects?

Once various technical and institutional challenges are worked through, then a plan for implementing nesting needs to be written, and consensus on it among key actors and stakeholders achieved.

The recommended contents of a nesting plan include:

- Summary of REDD+ strategy at the national level and vision for a nested accounting system.
- Summary of the steps taken to design the nesting plan.
- The technical requirements or standards that subnational programs/projects will need to adhere to, including how performance against the RL will be monitored, and how subnational RLs and emission reductions will be integrated into the national RL and MRV system.
- The technical benefits programs or projects will receive (e.g., access to NFMS data) and the associated timeline.
- The timeline for the technical requirements being met, as well as any procedures during grace or interim periods before full implementation.
- The technical support and financing available to support the transition. Capacity building program description.
- Contact details and grievance mechanism.

The four steps illustrated in Figure ES-2 highlight key challenges when designing an integrated carbon accounting framework.

Challenge 1: Understand the complexity, then drive towards simplicity. Through the assessment recommended in step 1, a deep understanding of the accounting methods being used in a country help in the design of a system that drives towards simplicity, while maintaining robustness.

Challenge 2: Design carbon accounting systems to support the activities and incentive systems being developed for REDD+. A participatory approach should be used to set the objectives of the system, to make everyone aware of the tradeoffs across benefits that may be necessary (i.e., more of this attribute, but less of that one), and of the impacts on existing and future subnational and project REDD+ activities.

Challenge 3: Decide the direction in which data from monitoring systems and regarding reference levels will flow. We identify three broad options:

1. a subnational/project-led approach, where data from lower levels is compiled to form a national dataset,
2. a flexible national approach, where there is a national forest monitoring system and reference level which integrates program and project level data, and
3. a strong national approach where there is a national forest monitoring system and reference level which does not integrate program and project level data, and lower level REDD+ activities are required to use nationally derived data.

Challenge 4: Integrate National Forest Monitoring Systems and Reference Levels by requiring compliance with a set of technical standards or requirements. The latter takes more effort to develop and implement, but leads to greater harmonization.

Challenge 5: Design fair and transparent approaches for handling overlapping programs or projects that maintain the environmental integrity of the emissions reductions claimed. These approaches could be combined, and could be phased in following a grace period.

Challenge 6: Clear and simple rules and procedures for integrating the carbon accounting of REDD+ programs and projects into the national approach need to be developed quickly. This can occur through trial and error by early actors in countries, and via accelerated methods development and vetting by international experts and consensus building processes, like the existing REDD+ initiatives and knowledge exchanges.

The final challenge is fully implementing the integrated accounting program, and adapting it as needed through:

- incorporating lessons learned from early experience,
- incorporating improved data or methods,
- Responding to the evolution of REDD+ initiative or other funding source requirement as they evolve, and any additional guidance from the UNFCCC, and
- adjusting to meet national or subnational legislation or policy decisions that emerge.

INTRODUCTION

The Warsaw Framework for REDD+ agreed to in 2013 by Parties to the United Nations Framework Convention on Climate Change (UNFCCC) sets out the general process and guidance that countries must follow in order to access results-based finance.² It requires countries to develop forest reference levels and forest monitoring systems at the national level or subnationally as an interim measure.³ However, the UNFCCC does not offer detailed guidance on precise methods countries or jurisdictions should use to set reference levels, how integration of national and subnational programs and projects or other critical implementation issues should be handled.⁴ Other initiatives like the Verified Carbon Standard's (VCS) Jurisdictional and Nested REDD+ Standard (JNR) or the Forest Carbon Partnership Facility (FCPF) Carbon Fund's Methodological Framework offer more specificity. This document provides an overview of methods being developed and issues emerging in establishing REDD+ programs at multiple scales, rather than any formal agreed methodology.

In many countries, subnational and project level REDD+ activities are being established to fulfill different aims, such as building capacity and experience in REDD+ implementation or generation of early emission reductions and removals in defined geographical or administrative areas. These subnational and project level activities may prove to be pilot or demonstration activities that are eventually subsumed into a national REDD+ approach. However, countries may choose to pursue REDD+ in the long term as a series of subnational and project-level interventions, which retain independence but in sum constitute the national approach.

Whatever the path taken, a process of integrating subnational and project carbon accounting into a national carbon accounting system will be required. The process of unification or integration of REDD+ projects and subnational efforts into the national system is commonly referred to as "*nesting*" or following a "*nested approach*".

Objectives and structure of this planning guide

Part A provides a brief introduction to integrated carbon accounting systems and the challenges in designing them.

Part B presents a structure for approaching the task of integrating subnational REDD+ program and project carbon accounting into a national carbon accounting system. Given the inherent complexity and the variety of circumstances faced, a consensus approach to designing an integrated accounting system has not yet emerged. In this planning guidance document we present a framework for:

² FCCC/CP/2013/10/Add.1, Decision 10/CP.19. *Coordination of support for the implementation of activities in relation to mitigation actions in the forest sector by developing countries, including institutional arrangements*. UNFCCC, 2014.

³ UNFCCC Decision 1/CP.16, paragraph 71

⁴ In this paper, "subnational" is used to refer to both programs and projects, and the term "subnational programs" is often used to refer to both programs and projects for simplicity.

1. analyzing current REDD+ systems within a country,
2. setting the scope and objectives of the nested accounting system,
3. designing the technical architecture of the national system, and
4. rolling out—gradually implementing—the nesting plan.

Throughout the document examples of early experiments in defining the relationship between subnational and national REDD+ systems are given in text boxes or within the text.

Audience and assumptions

This document is aimed at national level REDD+ decision makers, REDD+ committee or taskforce members and other stakeholders working with the REDD+ process. Those reading this planning guide are likely to have already decided that nested accounting will form part of their country's approach to REDD+. If this has not yet been decided, the decision can be informed by *LEAF's Decision Support Tool on Integrated REDD+ accounting frameworks: Nested national approaches* (Broadhead *et al.*, 2013), and other documents in the References section. This document may also prove useful in evaluating alternative nesting options, before a final decision is made.

Issues outside the scope of this document

This document focuses on integrating the carbon accounting systems of different scale REDD+ programs and projects within a country. The integrated carbon accounting system will need to be aligned with the political, legal and economic landscape of the country and its REDD+ programs—yet be consistent with UNFCCC and specific climate standard or funding program guidance (e.g., VCS, FCPF, UN-REDD, REDD Early Movers). Therefore, in designing the national REDD+ system, many political, legal and economic decisions will need to be made. However, this document focuses on the technical architecture of national carbon accounting.

Complementary guidance material

This guidance complements and refers to existing technical guidance that explains how to design national REDD+ carbon accounting systems, including:

- Brown, S. *et al.*, 2013. *LEAF Technical guidance series for the development of a national or subnational forest monitoring system for REDD+*. USAID LEAF.
- Harris, N., Pearson, T. and Brown, S., 2012, with updates in progress. *Decision support tool for developing reference levels for REDD+*. Winrock International/World Bank Forest Carbon Partnership Facility and its related technical guidance documents.

Users of this guide may benefit from first reading USAID LEAF's decision support tool for integrated REDD+ accounting frameworks:

- Broadhead, J. *et al.*, 2013. *Decision support tool: Integrated REDD+ accounting frameworks: Nested national approaches*. USAID LEAF.

An indexed reference list can be found at the end of this document.

PART A – AN INTRODUCTION TO NESTED CARBON ACCOUNTING SYSTEMS

Why is nesting necessary?

Under REDD+ the ultimate objective of carbon accounting is to calculate in a transparent, consistent, complete and accurate way the emission reductions that have resulted from REDD+ activities relative to an agreed reference emissions level. Through various existing mechanisms (such as voluntary carbon markets and bilateral results based payment programs), these emission reductions can have a financial value to those responsible for generating them.

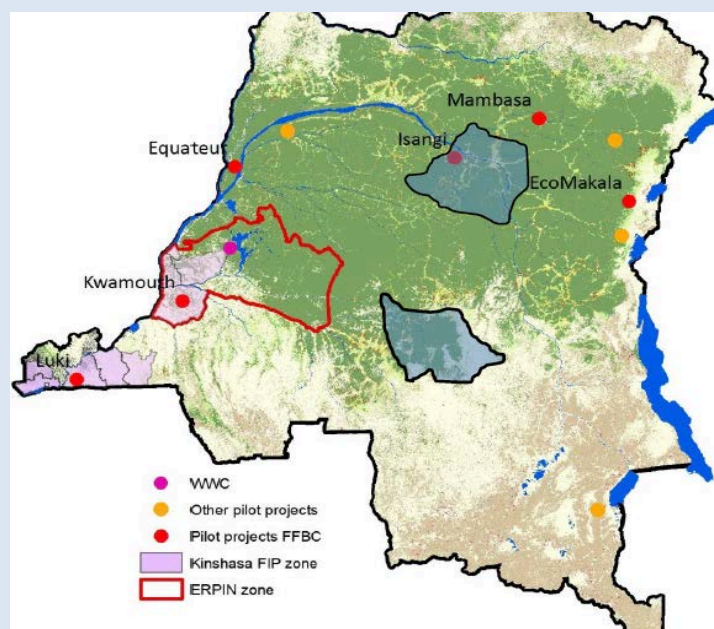
Most if not all countries pursuing national-level REDD+ consistent with UNFCCC guidance have subnational scale REDD+ pilot programs and/or project-scale REDD+ activities in some stage of development. These programs typically have their own carbon accounting methods consisting of reference levels, forest monitoring systems, and eventually procedures for validation and verification.

Unless there has been concerted coordination, there will be a variety of accounting methods used in a range of programs at a range of geographic scales. In order to move forward with developing national REDD+ accounting systems, a process of integrating (or ‘nesting’) the different carbon accounting systems is necessary, in order that:

- there is consistency in how emissions and emissions reductions are measured within projects and programs within a country,
- double counting of emission reduction can be avoided, to preserve environmental integrity where there is overlap with the scope of the national carbon accounting system,
- payments based on performance can be fairly allocated to those who have achieved them, and

Box 1: Nested REDD+ in the Democratic Republic of Congo (DRC) – a typical complex scenario.

The map below depicts DRC and its various ongoing REDD+ programs and projects. The red polygon shows the Maï Ndombe jurisdictional program, which is both applying to the FCPF’s Carbon Fund and is being designed in accordance with the VCS JNR requirements. Maï Ndombe jurisdictional program contains project level activities nested within it. (Also see Box 6 and Box 11).



Source: DRC ER-PIN Carbon Fund Presentation, April 9, 2014

- economies of scale can be achieved through shared use of measuring, monitoring and reporting systems.

Cases could exist where multiple layers of integration are required; for example a project operating in a jurisdiction that is itself integrated into a national accounting scheme. For REDD+ to be practical there needs to be a drive towards simplicity and harmonization at each level of nesting. Therefore, ideally, any level of REDD+ program development should aim to integrate one level of activity below it. This example of project-jurisdictional-national integration is likely to occur in many countries with early REDD+ activities, so resolving nesting issues may need to be performed at multiple scales simultaneously.

Communities, developers, donors and investors need confidence that there is a structure of accounting, monitoring and reporting systems that will be able to transparently and consistently determine the emissions reductions achieved by their efforts. This confidence is an important factor in spurring investment and action on reducing emissions.

What are the main components of a nested carbon accounting system?

Figure below shows an overview of a national forest or REDD+ carbon accounting system. To quantify emissions under REDD+, emissions and removals from various activities across the landscape need to be monitored and quantified. Under the UNFCCC, countries are required to do this by establishing a National Forest Monitoring System (NFMS) that is robust, transparent and provides consistent data over time.⁵ Most systems will use a combination of remote sensing and ground-based carbon inventory approaches to estimate anthropogenic forest area changes, forest carbon stock changes and ultimately GHG emissions.

The NFMS and other data will be used to create the carbon emissions and removal factors and real-time activity data that are used to estimate the ongoing emissions or removals resulting from the REDD+ program. The emissions factors also can be used with historic activity data to calculate the historic emissions from which a projected reference level can be constructed. Procedures to account for leakage within the country and the risk of non-permanence need to be undertaken before a report is made and ultimately verified through UNFCCC or other program procedures.

The pre-existence of subnational REDD+ programs and/or projects raises a number of challenges, since they will have:

- REDD+ strategies aimed at addressing drivers of deforestation and degradation and activities reflecting a variety of local land use change and economic drivers,
- carbon pools and emissions sources that will overlap with the national system to varying extents,

⁵ Decision 4/CP.15 <http://unfccc.int/resource/docs/2009/cop15/eng/11a01.pdf#page=11>

- forest monitoring systems which may be generating a variety of data using different methods and timeframes from those proposed in the NFMS,
- reference levels that may be based on a range of historical data and that use various projection methods, and
- different reporting and verification requirements, procedures and frequencies.

This planning guide walks users through a series of steps to overcome the challenges associated with these circumstances, leading to the design of a nested accounting system.

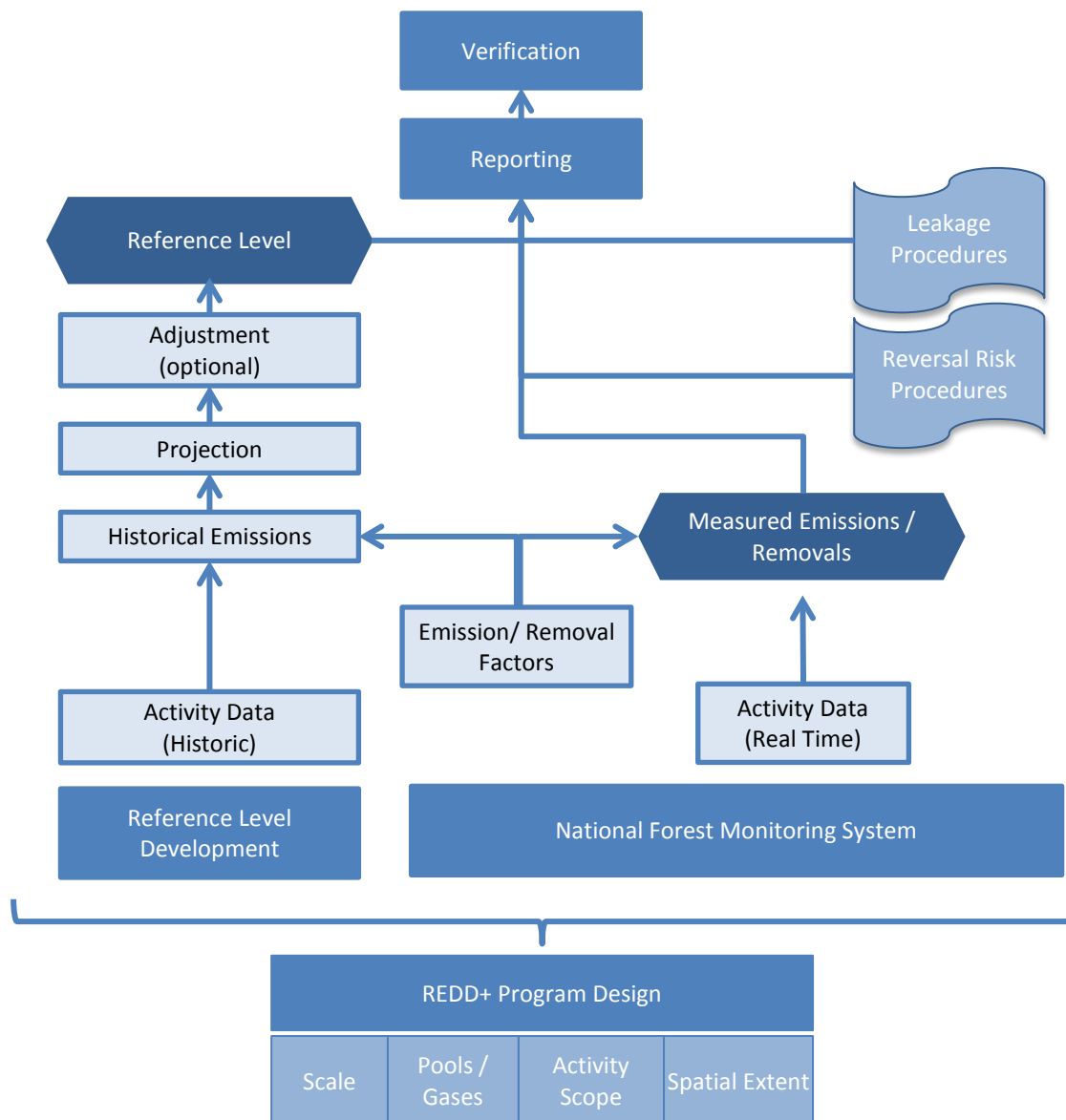


Figure 1: Technical components of a national carbon accounting framework (adapted from Pearson, T. *et al.*, 2013)

What are the main approaches for structuring a nested carbon accounting system?

Where there is overlap between the REDD+ activities proposed subnationally and those of the national REDD+ program, a plan for integrating carbon accounting into the National Forest Monitoring System will be required.⁶

National Forest Monitoring Systems and RLs are largely based on spatially explicit data. Where there are existing regional or project-level monitoring systems or RLs, decisions need to be made about if and how they should be incorporated into the national system.

Three broad approaches to nesting are identified here and summarized in Figure below:

1. a subnational/project-led approach,
2. a flexible national approach, and
3. a strong national approach.

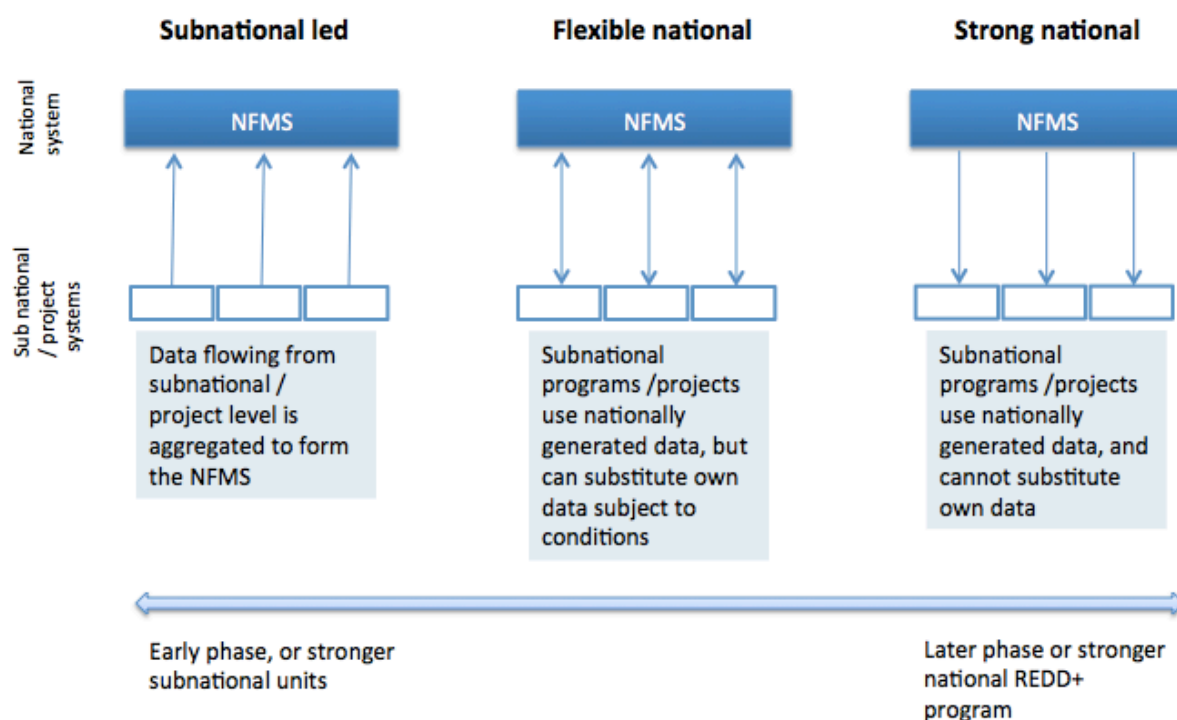


Figure 2: Alternate approaches to REDD+ national and subnational accounting, using the example of the national forest monitoring system (NFMS).

In practice, the approach selected is likely to fall somewhere along a gradient across these definitions, and a country could blend approaches. For example, a country could take a strong national approach to accounting for avoided deforestation, requiring use of its NFMS land cover change data, forest definitions, and monitoring results, but allow subnationally led

⁶ An example where activities may not overlap could be a subnational program for afforestation and reforestation, as well as a national-level avoided deforestation strategy.

afforestation accounting where the NFMS does not adequately report it. Countries also can develop their approach over time, for example starting with subnational-led pilots for which the national program subsequently assumes control of and responsibility. Many current REDD+ programs are evolving – from pre-REDD+ forest inventory data and nascent MRV systems that typically do not provide complete national forest land coverage, to introduce methodological and data enhancements designed to reduce the uncertainty of emission reductions estimates or to meet funding program requirements. Box cases offer examples of enhanced methods being explored.

Despite this continuing evolution, the three-approach typology is useful in grouping conditions surrounding how nesting will be executed. Since examples of mature nested systems that conform to the three approaches are scarce, we highlight elements of programs that illuminate common trends or unique features.

Approach 1: Subnational/project-led approach to a nested accounting system

In this approach, the national REDD+ NFMS and reference levels are a summation of the existing and eventual subnational and project-level units. In locations where no subnational programs or projects exist, information gathering for purposes of reference level creation, activity data monitoring and emissions measurement would still need to take place to achieve complete national accounting coverage. Given differential capacity, access to funding, and subnational policy positions, this approach is likely to favor a few motivated, high-capacity early actor jurisdictions. Associated equity considerations include limited access to funding and technical expertise for the majority of entities.

This approach is suitable when:

- national capacity or political leadership is lacking, but some jurisdictions are strongly led and/or receive significant external funding;
- there are already REDD+ pilot jurisdictions and/or a large projects areas; or
- regulation and control of forests and related activities is decentralized, or central authorities have weak control over the jurisdictions.

If there are gaps between the subnational programs (as is likely, reviewing current experience), then this would not be a truly national approach, since some land areas or provinces would not be fully included. Instead this would most likely be a transitional phase on the way to developing a national approach, as ultimately required under UNFCCC guidance.

Table 1: Summary of subnational/project-led approach

Advantages	Disadvantages
<ul style="list-style-type: none"> • Allows a country to move forward before a national system is defined • Rewards innovative approaches and investment at subnational and project levels 	<ul style="list-style-type: none"> • Likely only suitable as a transitional approach • Lack of national control (though could be an advantage if national level is weak) • May result in a proliferation of methods and

- Allows a 'national' system to evolve organically over time, maximizing the use of existing systems
- Important local variation in carbon stocks or patterns of deforestation can be accounted.⁷

approaches that hinder transition to a national approach

- Implementation of data collection, monitoring, and measurement by each subnational activity or project may lead to duplication of effort or incomplete accounting
- Leakage between or outside of accounting areas would need to be accounted for
- Financial, technical, and human resources distributed across many entities.

Considerations when building the system

- A method for combining subnational data from multiple sources to create the NFMS will be required
- Reference level data will need to be summed for a national RL, and possibly revised once the issues associated with different subnational methods become apparent
- Plan for transition to national or more comprehensive subnational system.

Box 2: Example of a subnational/project-led approach – Peru

Nationally, Peru has been undergoing a process of decentralization, giving greater authority over natural resource management to regional government departments (provinces). This has influenced Peru's choice of a three-tiered (local, regional and national) phased nested approach to REDD+ allowing states with existing REDD+ projects and initiatives to move ahead in developing subnational RLs. As the map below shows, one department, Madre de Dios, had several NGO-led REDD+ pilot projects and is leading the development of a department-wide RL, then attracted cooperation from a second department (San Martin) and eventually from the national government over a five-year period.

The national government's Technical Group for the Reduction of Greenhouse Gases Stemming from Deforestation and Forest Degradation manages a National REDD+ Roundtable that serves as a forum for dialogue and technical consultation between the government and civil society actors. The National REDD+ Roundtable interfaces with Regional REDD+ Roundtables, which are serving as a bottom-up influence for the design and implementation of national REDD+ strategies.

The San Martin and Madre de Dios departments have been selected as pilot regions for developing subnational RLs which, together with other department-level RLs, will eventually serve as the basis for a national RL, work on which has commenced. The methodologies and technologies for constructing the RLs in these departments are being developed through engagement with the Regional REDD+ Roundtables.



Source: Peru R-PP presentation

(https://www.forestcarbonpartnership.org/sites/forestcarbonpartnership.org/files/Documents/PDF/Mar2011/Peru%20R-PP_24_03_11.pdf)

⁷ VCS JNR Req. 3.14.7 states that higher-level monitoring data can be used by lower level programs or projects as long as the accuracy and precision requirements for the lower levels are met.

Approach 2: Flexible national-led approach to a nested accounting system

In a flexible national-led approach, the national REDD+ program leads the design and implementation of the accounting system, but builds on existing subnational work and data to supplement national data or methods. Often jurisdiction-scale data are more accurate or offer higher geospatial resolution.

This system is suitable when:

- There is strong central and jurisdictional capacity;
- There are already pilot jurisdictions and/or a large number of projects, but a desire to advance towards national-scale REDD+.

Table 2: Summary of flexible national-led approach

Advantages	Disadvantages
<ul style="list-style-type: none">• Maintains national control• Rewards innovative approaches and investment at subnational and project levels• Important local variation in carbon stocks and deforestation rates could be used, and higher-tier emissions factors or activity data produced⁸• Allows greater optimization of available data and monitoring capacity.	<ul style="list-style-type: none">• A more complex accounting system will be required• Requires approval process to ensure consistent approach and quality• Large disparities in methods and outcomes could exist, if the technical controls are not tight enough.
Considerations when building the system	
<ul style="list-style-type: none">• A method for disaggregating NFMS data to projects and subnational programs will be required where data are not spatially geo-referenced (e.g., tabular forestry inventory data are used), if this is allowed• RLs will need to be disaggregated and allocated down to projects and subnational programs in some way• Rules for existing subnational programs/projects will be required• Rules need to be developed for including lower-level data into the national REDD+ program.	
Box 3: Example of a flexible national-led approach - Lao People's Democratic Republic (Lao PDR)	
<p>Lao PDR's economy is centrally planned and all land and natural resources are held by the state and the REDD+ responsibilities of Ministry of Natural Resources and Environment and the Ministry of Agriculture and Forestry are coordinated by the national REDD+ Taskforce. The national government is in the process of developing national land cover maps and developing a forest inventory system. However, in the interim, activity data and emission factors are being developed at the subnational scale by, among others, USAID LEAF in collaboration with the GIZ-funded Climate Protection through Avoided Deforestation (CLiPAD) project in the Houaphan Province. There is a strong desire to allow for subnational data to feed into and integrate with national system. While the national system is still under construction, it is hoped subnational efforts will be able to move forward and capture financing.</p>	

⁸ VCS JNR Req. 3.14.4 states that incorporating lower level data into monitoring is best practice.

Approach 3: Strong national-led approach to a nested accounting system

Under a strong national-led approach the national REDD+ program leads in designing and implementing elements of the accounting framework. The national government provides guidance via legislation, pilot programs, or ministerial regulations. Subnational and project-level activities are required to comply or follow special procedures (explored below).

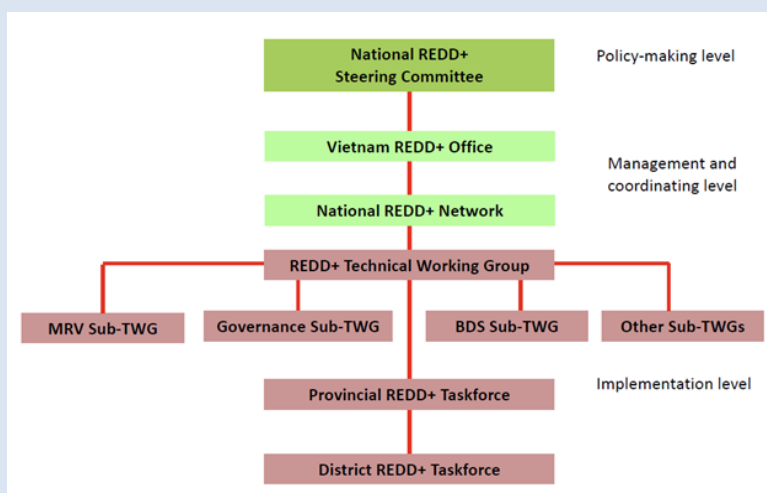
This approach is a suitable when:

- There is strong central capacity and funding;
- There are no existing pilot jurisdictions, and no projects, or they agree to comply with national guidance;
- Control of forests and other relevant resources is relatively centralized, via national land tenure regimes or ownership.

Table 3: Summary of strong national-led approach

Advantages	Disadvantages
<ul style="list-style-type: none"> • Relatively simple to implement • Potential for optimizing resource use - accuracy and precision targets reached at national level, one monitoring system developed • Greater assurance of spatial and temporal consistency. 	<ul style="list-style-type: none"> • Does not promote independent action and investment in pioneering data gathering approaches at subnational and project levels • Important local variance in land use, activity data, and emission factors may be lost, leading to potentially lower precision or accuracy • May disengage subnational actors in the REDD+ process if they are not adequately involved • Results may vary markedly from existing projects' emission reduction projections causing uncertainty for developers and investors in the short-medium term.
Considerations when building the system <ul style="list-style-type: none"> • A method for disaggregating NFMS data to projects and subnational programs will be required where data are not spatially geo-referenced (e.g., tabular forestry inventory data) • RLs will need to be disaggregated and allocated down to projects and subnational programs (to the extent they are permitted) • Rules for existing subnational programs/projects will be required. 	
Box 4: Example of a flexible approach transitioning into a strong national-led approach – Vietnam <p>In Vietnam, the Vietnam Forest Administration (VNFOREST) under the Ministry of Agriculture and Rural Development (MARD) is responsible for all climate change activities in the forestry sector, including REDD+, as determined by the National Target Program to Respond to Climate Change (2008), chaired by the Prime Minister. VNFOREST consists of Forest Protection Department, Forest Inventory and Planning Institute, eight functional Departments and six inter-provincial National Parks, and is in the process of conducting Vietnam's fifth National Forest Inventory, which improves on the first four, beginning in 1990.</p> <p>As the organogram below shows, the National REDD+ Steering Committee, chaired by MARD, coordinates all REDD+ efforts and activities, supported by private organizations, NGOs, and international development partners at the central and local level. However several provinces began REDD+ strategies in parallel to the national process being organized.</p>	

Vietnam is one of the original UN-REDD pilot countries and is now in its Phase II funding and work plan, and was one of the earliest to receive support from the Forest Carbon Partnership Facility (FCPF). Japan International Cooperation Agency (JICA), GIZ and the USAID LEAF and Vietnam Forests and Deltas programs are also helping build capacity in Vietnam with ongoing REDD+ activities in Lam Dong, Thanh Hoa, Nghe An, Quang Binh, Lao Cai, Bac Kan, Ha Tinh, Binh Thuan and Ca Mau



provinces. These activities all feed into the national program and are coordinated by the Vietnam REDD+ office and Provincial Taskforces. Although the pilot provinces have individually undertaken estimation of their RLs, using differing methods, VNFOREST and others are beginning to consider guidance for setting the national RL and how it would be allocated down to each province, and the potential need for enabling legislation. In October, 2014, VNFOREST submitted a proposal (Emission Reductions Program Idea Note or ER-PIN) to the FCPF Carbon Fund for an Emission Reductions Program in six north-central provinces, largely relying on a JICA baseline data set and study for the reference level work. The ER-PIN process has nurtured early discussions among many provinces and the central government about how reference levels and MRV design will be performed at the province level and eventually integrated into the national level RL. VNFOREST has also commissioned an issue paper by external experts to provide optional approaches and to assess implications. Viet Nam might be considered a flexible national approach becoming a strong national one over time.

Sources:

Institutional Arrangement for REDD+ in Viet Nam: http://www.VietNam-redd.org/Upload/CMS/Content/Introduction/1-institutional%20arrangement%20for%20REDD%20in%20VN_final.pdf

The REDD Desk – Viet Nam Country Page: http://theredddesk.org/countries/Viet_Nam

Table 4 below summarizes examples of the three approaches being explored across a range of countries.

Table 4: Overview examples of the three approaches

Country or jurisdiction	Nesting approach envisioned in current strategy	Key features of approach	Reference
Subnational-led approach			
Nepal	REDD implementation starting subnationally in a large, contiguous pilot region. A regional REDD focal desk coordinates with national REDD cell in government.	The sustainable forest management program in the Terai Arc Landscape is developing and historical RL for the FCPF ER-PIN (including emissions, removals, and degradation estimates) intended to inform the eventual national RL.	Nepal FCPF ER-PIN, 2014 http://theredddesk.org/countries/nepal/
Flexible national approach			
Mexico	National REDD+ planning with REDD+ early action areas (ATREDD+) in 5 federal states (Campeche, Chiapas, Jalisco, Quintana Roo. And Yucatan), for which RLs have been constructed.	ATREDD+ areas will test institutional arrangements, governance structures, MRV mechanisms and contribute to the construction of a national RL using historical data from the two National Forest Inventory (NFI) periods (2004-2007 and 2009-2013), remote sensing analysis, and use of the well-known carbon stock gain-loss Carbon Budget Model of the Canadian Forest Service. Essentially envisions national-level RL with state-level monitoring.	http://theredddesk.org/countries/mexico/ Mexico FCPF ER-PIN, 2014
DRC	National REDD+ Framework to adopt methods and approaches tested at the subnational level, but significantly influenced by the first subnational pilot.	First subnational pilot area, Mai Ndombe ER Program Area, produced a RL expected to be used as the province RL within national RL. An NFMS is being designed that will integrate more detailed data from the subnational pilot area by roughly five land use activity strata (e.g., illegal logging concessions, areas outside of concessions, conservation areas, and tree planting and natural regeneration areas with other strata.	DRC FCPF ER-PIN presentation, 2014; and ER-PIN in DRC, 2014
Indonesia	Essentially, subnational implementation of a national approach, linking National REDD+ Action	The REDD Task Force developed draft RLs for 11 provinces, although they were not officially adopted. And would need to be	Indonesia, FCPF October 2013 Country Progress Sheet The REDD Desk, Indonesia

	Plan and the Provincial Strategy and Action Plans, but continually evolving.	harmonized with national climate change action plans. Central Kalimantan was identified as the first REDD+ pilot province, with eight other official pilot projects. Recently national momentum has shifted to producing a top-down national RL that would be allocated to the provinces.	country profile Presentations and discussion at the Asia LEDS Forum, Yogyakarta, November, 2014
Costa Rica	National MRV and accounting system that can handle accounting for multiple payments for performance schemes, such as VCS JNR (at national level) and the World Bank's Carbon Fund (also at national level).	National Forestry Inventory data and methodologically standardized forest cover maps will be used for the national RL. Establishing a reference level and monitoring system in accordance with VCS JNR and World Bank Carbon Fund standards. Approach to project level REDD+ not yet articulated.	Costa Rica, FCPF ER-PIN, 2013
Strong national approach			
Vietnam	REDD+ implementation coordinated by National REDD+ Steering Committee. Methods and approaches tested and operationalized at the subnational level through Provincial REDD+ Action Plans (PRAPs). Transitioning into strong national approach.	Preliminary provincial RLs established for individual provinces in Vietnam (Lam Dong, Thanh Hoa, Nghe An, and Quang Binh). Interim RL developed for UN-REDD Phase II pilot provinces (Lao Cai, Bac Kan, Ha Tinh, Lam Dong, Binh Thuan, Ca Mau).	Vietnam FCPF ER-PIN, 2014

PART B – STEPS TO DESIGN AND ROLL OUT A NESTED ACCOUNTING SYSTEM

Given and the variety of circumstances that countries face, and the rapidly evolving international and national climate regime, there is no single approach to designing an integrated accounting system. Thus the steps shown in Figure for designing and rolling out a nested accounting system should be seen as a framework process rather than a prescriptive set of instructions.

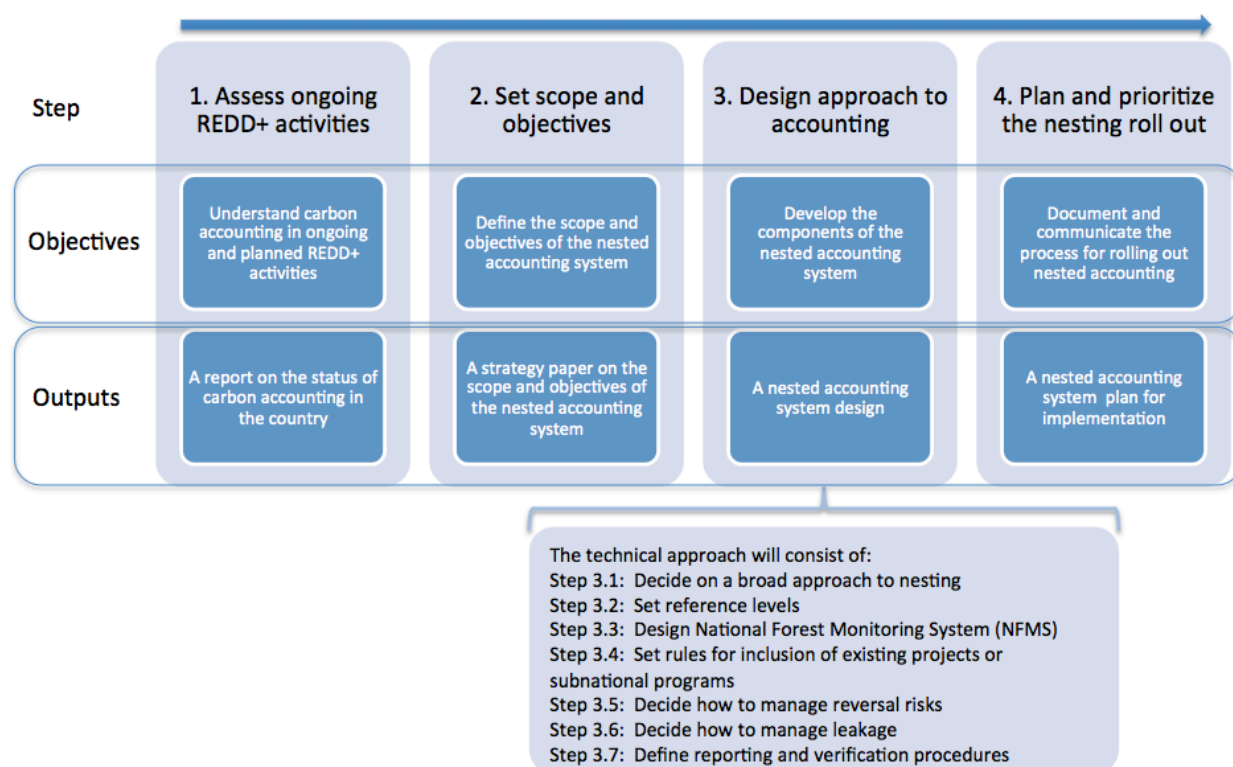


Figure 3: Steps to integrate subnational REDD+ programs and projects into a national carbon accounting framework

Step 1 involves conducting an assessment of REDD+ activities in the country. This builds a deep understanding of their scope of activities, and carbon accounting methodologies.

Step 2 uses the information generated in step 1 to set the scope of the REDD+ accounting framework, and what programs and projects need to be nested into it. It also sets the broad objectives that the technical approach then aims to meet.

Step 3 guides readers through the main technical decisions that will need to be made.

Step 4 concludes the process with suggested approaches to planning and rolling out the nested accounting system.

STEP 1. ASSESS ON-GOING REDD+ ACTIVITIES

Objective	Suggested Output
To understand the carbon accounting underway in ongoing and planned REDD+ activities.	A report on the status of carbon accounting in the country.

Step 1a: Identify in-country REDD+ activities that could be integrated

The first step is to identify projects, programs and policies related to the objectives of REDD+ that quantify emission reductions and receive related incentives.

This identification should include both ongoing activities and planned activities (Figure 4). Historical programs or projects will need to be included if the national program is back-dating the start of its accounting period. In addition, relevant non-forestry projects should be included (such as cookstove distribution efforts that receive emission reductions and reduce pressure on forests), may to be certain their avoided degradation emission reductions are accounted for in the national forest monitoring system to avoid double counting. See Step 3.1 below for more details.

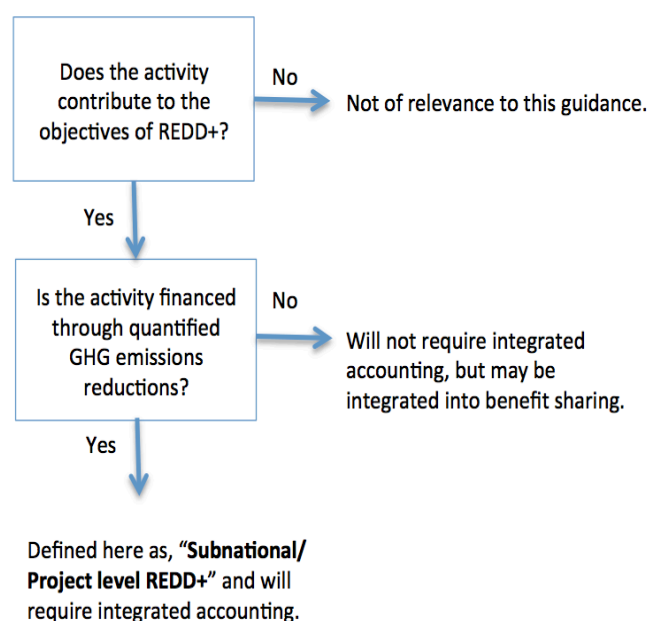


Figure 4: Decision tree for activities requiring integrated accounting

Step 1b: Gather technical details of REDD+ activities

Table 5 lists questions to be answered to inform the design of the integrated accounting system. To answer these questions, basic information about the technical architecture of each program and/or project identified should be gathered.

Table 5: Questions to answer during an assessment of ongoing REDD+ activities

#	Technical component	Questions to answer in relation to subnational programs and projects	Why this is important
A. REDD+ Activity Scope			
A.i	Activity scope	<ul style="list-style-type: none">What REDD+ activity types are being implemented in existing or anticipated subnational REDD+ programs and projects in the country?What activity types are planned by the national REDD+ program?	<ul style="list-style-type: none">Integrated carbon accounting is only needed where the carbon accounting between national and subnational/project accounting overlaps in terms of the activities accounted for, the spatial area covered and the GHG pools, sources and sinks, or where there is potential for leakage between project/subnational and national activities and pools.
A.ii	Spatial scope	<ul style="list-style-type: none">What are the spatial boundaries of existing subnational programs and projects, including leakage areas?	
A.iii	Pools and gases	<ul style="list-style-type: none">What pools and gases are included in ongoing projects and activities?	
B. National Forest Monitoring System			
B.i	Land cover classification	<ul style="list-style-type: none">Is there a national forest inventory and/or classified land cover map?If so, is the level of detail suitable for subnational and project level activity measurement?If so, is this map used by national, sub-national and project level activities in the country for emissions calculations?If other classification systems are being used at the sub-national level, how do they differ from the national classification map?	<ul style="list-style-type: none">An agreed upon national forest inventory and land cover classification map is one of the fundamental pieces of a national forest monitoring system, since it is the basis for tracking land use cover change. A national map is a good start, although to be used at the project level it must be of a suitable resolution for project-scale activities. If no such map exists, a decision needs to be made whether to make one, or to combine subnational maps into a national map.
B.ii	Carbon stocks and emissions factors	<ul style="list-style-type: none">What methods have been used to estimate carbon stocks of land cover strata at national, subnational and project levels, and stock growth and degradation over time?Do the methods meet IPCC Good Practice guidelines, or other technical standards?	<ul style="list-style-type: none">Donors and standards usually set requirements around the methods used to generate emissions factors, so the standards adhered to will need to be understood before they can be included in a national system.
B.iii	Activity data	<ul style="list-style-type: none">Has activity data been collected in subnational programs and projects in the country?If so, at what scale (project, subnational and/or national?), over what time period and at what monitoring frequency? Also, what methods and data sources are used?	<ul style="list-style-type: none">Activity data may be in the form of remotely sensed land use change analysis, but could also include ground inventories and surveys. Project and jurisdictional data could be gathered input into a national system if methods are compatible.
B.iv	Carbon stock change calculations	<ul style="list-style-type: none">What carbon stock changes are being monitored, and how are they attributed to subnational programs and projects, and over what time periods?	<ul style="list-style-type: none">Ultimately accounting methods result in claims on the emissions avoided or sequestered from a given area over a given period of time. Carbon stocks are the starting point for the

			calculations outlined below, leading to emission reduction allocation. Claims of reductions will determine any overlaps in accounting systems.
C. Reference levels			
C.i	Setting reference levels	<ul style="list-style-type: none">For what activities have reference levels been set?Over what area have reference levels been set?What methods have been used to create reference levels?Are activities included in the reference levels spatially explicit?When do the reference levels expire—i.e., when would subnational RLs need to be revised, or be replaced by a higher-level regional or national RL? How are estimated future baseline emissions allocated between nested projects and areas outside projects?	<ul style="list-style-type: none">Overlapping reference levels are one of the main challenges that will need to be overcome in a nested system. Changing a reference level will affect the volume of emission reductions and hence the economics of any program. Reference levels have finite periods of applicability, their renewal time is a good time to impose any changes in methods, to limit their impacts on programs.
D. Reversals and leakage			
D.i	Reversals and buffer systems	<ul style="list-style-type: none">What systems are being used to address the risk of reversals within the country?	<ul style="list-style-type: none">Buffer or insurance systems may already exist in projects or jurisdictions.
D.ii	Leakage allocation	<ul style="list-style-type: none">What systems are in place for tracking leakage in subnational programs and projects?How will emissions outside project areas be attributed to projects, or vice versa, and how will associated calculations be performed?	<ul style="list-style-type: none">Leakage management at the national level involves identifying and attributing leakage between project and non-project areas, or between subnational areas. Existing projects and jurisdictional programs may have such systems already in place.
E. Reporting and verification			
E.i	Reporting	<ul style="list-style-type: none">What data is being reported by subnational programs and projects and to whom?What is the reporting frequency?	<ul style="list-style-type: none">Economies of scale can be achieved by combining or syncing reporting and verification procedures related to carbon accounting in the country.
E.ii	Verification	<ul style="list-style-type: none">What verification procedures do subnational programs have in place, and what is their frequency? Have any verifications been conducted already?	
F. Overarching technical questions			
F.i	<ul style="list-style-type: none">What standards are being followed in designing REDD+ technical approaches? (e.g., VCS, Carbon Fund Methodological Framework, Plan Vivo, Gold Standard)Over what time periods do the programs or projects operate?		<ul style="list-style-type: none">National accounting systems may be able to set simple rules around the permissibility of various carbon standards or accounting systems, instead of setting many technical requirements. Thus it is important to know which standards are being used at present for carbon accounting.
G. Other non-technical questions useful in understanding the overall picture of REDD+ activities			
G.i	<ul style="list-style-type: none">Who are the proponents and partners involved in the		<ul style="list-style-type: none">The proponents, stakeholders and

	projects or programs? <ul style="list-style-type: none"> • Who are the project stakeholders? • Who are the beneficiaries of emission reductions payments in the country? 	beneficiaries will all be impacted by rules imposed under a nested system and need consulting throughout its development.
G.ii	<ul style="list-style-type: none"> • What other data on carbon stocks or activity data is being collected, or will be collected? 	<ul style="list-style-type: none"> • Existing data gathering programs that are not REDD+ specific could be utilized by the NFMS.

Box 5: REDD+ Project Assessment – Cambodia

In 2013, Cambodia undertook a review of the institutional arrangements and methodological approaches used in REDD+ project activities in Cambodia. The review evaluated commonalities and divergences in order to provide decision makers and stakeholders with information on how current REDD+ activities can be integrated into a national framework. Cambodia is still in the early stages of developing a jurisdictional REDD+ program. As the draft ER-PIN for the FCFP Carbon Fund notes, government discussions revolve around initiating subnational implementation, in areas that still need to be selected. As Cambodia did not yet have any jurisdictional scale pilots, the 2013 analysis (and the draft ER-PIN) focused on three projects at various stages of development: the Oddar Meanchey Community Forestry REDD+ Project, the Seima Protection Forest REDD+ Project, and the Prey Lang REDD+ Project.

Key findings included the relatively limited scope of REDD+ activities and pools that projects considered, and the differences in reference level construction, which varied from simple historical averages to a logistic function that projects an increasing rate over time. However, commonalities were found, particularly with respect to MRV, which included the application of Tier 3 activity-based stock change accounting, field based sampling of forest carbon stocks (employing the same minimum diameters, forest strata, allometric equations and carbon fraction of biomass), and monitoring land use change via analysis of classified Landsat imagery.

The report of the review can be downloaded here:

www.leafasia.org/library/survey-and-analysis-redd-project-activities-cambodia

STEP 2. SET SCOPE AND OBJECTIVES OF REDD+ ACCOUNTING SYSTEM

Objective	Suggested Output
Define the scope and objectives of the nested accounting system, including how technical standards will be met.	A consultation process resulting in a strategy paper on the scope and objectives of the nested accounting system.

Setting the scope and objectives of the integrated carbon accounting system involves three sub-steps:

Step 2.1: Define the activities, pools and areas to be included

Step 2.2: Map out the technical standards that need to be met

Step 2.3: Set overall objectives for the integrated carbon accounting system.

Step 2.1: Define the activities, pools and areas to be included in the REDD+ accounting system

Step 2.1.1: Identify overlapping and non-overlapping REDD+ carbon accounting

Using the results of the assessment in Step 1 and the national REDD+ strategy, the overlaps in carbon accounting systems should be identified. Overlaps occur where a particular area is undergoing the same REDD+ activity and accounting for the same pools and gases at the subnational level as planned in the national program.⁹ A procedure would also need to be developed to identify emerging programs and determining the degree of overlap. A central REDD+ activity registration process is one way to achieve this. The outcome of this process should be a clear mapping of the carbon accounting systems that are or will be in operation within a country. Step 3.1.2 below describes the options for non-overlapping areas, while the rest of this guide is dedicated to the process of nesting the accounting where overlap does occur.

Step 2.1.2: Decide on treatment of non-overlapping REDD+ carbon accounting activities

Where REDD+ activities have been identified that do *not* overlap with the national REDD+ program (e.g., due to activity type or spatial area), a decision needs to be taken about how to handle their accounting, reporting and verification with respect to the national program. An example of this would be where the national REDD+ program only covers avoided emissions from deforestation, but there are subnational afforestation projects claiming carbon emission reductions. One option is to expand the planned national accounting to include them. If this is not preferred at this time, there are a number of approaches that could be undertaken.

⁹ VCS Req. 3.8.3 states that deforestation and degradation may not have overlapping reference levels spatially.

Note: In the following sections,

- ✓ ticks are used to highlight possible advantages of a particular approach, and
- ✗ crosses are used to highlight possible disadvantages.

Approach 1 – Allow independence

Programs and projects could be allowed to continue to issue emission reductions and operate in complete independence from the national program. A voluntary registry of projects could be established to help gather information on REDD+ activities that are beyond the national program's scope.

- ✓ Avoids stifling programs/projects by imposing additional requirements.
- ✗ The national REDD+ program will not control all REDD+ activities in country.

Approach 2 – Place restrictions/requirements on activities

Subnational programs that quantify emission reductions from land use changes but are not covered by the national REDD+ program could be restricted or required to meet additional requirements. Such restrictions or requirements could include:

- Banning the activities from generating carbon emission reductions.
 - ✓ Gives the national system complete control over emission reductions quantification and eliminates the risk of double counting.
 - ✗ Stifles activities, could increase uncertainty for investors, and comparatively could raise emissions in the country.
- Requiring reporting of emission reductions to the national program so that results can be incorporated into national GHG reporting requirements (see step 3.5 below for more details).
 - ✓ Allows national programs to account for all claimed emission reductions at the national level and avoids potential double counting.
- Requiring registration in a central registry, contingent on specific accounting requirements being met or safeguards and the safeguard information systems being in place.
 - ✓ Gives the national REDD+ program comprehensive information on projects/programs and control over project quality.

Step 2.2: Map out the requirements that need to be met under the proposed REDD+ accounting system

There are a variety of technical standards that a nested accounting system could aim to meet. All national level REDD+ programs seeking results-based payments under the UNFCCC will need to adhere to the REDD+ rulebook – a set of decisions regarding REDD+ monitoring, accounting, reporting and verification. While important, these requirements are relatively high level and leave a lot of flexibility for different approaches. If countries wish to access other multilateral or bilateral finance, then more detailed requirements set by the donors also will need to be met. For example, the FCPF Carbon Fund, which purchases emission reduction units, has a Methodological Framework that must be adhered to by programs applying to it.

Finally, voluntary carbon standards can be used by national, subnational and project level REDD+ activities and have very specific technical requirements.

Table 6 below summarizes the requirements of the UNFCCC Warsaw Declaration on REDD+, the Verified Carbon Standard's Jurisdictional and Nested REDD+ Standard (which has emerged as a leading voluntary standard for designing nested accounting systems), and the requirements of the FCPF Carbon Fund.

To ensure that the accounting system is designed to meet the necessary technical standards, the tasks in Figure 5 should be undertaken.

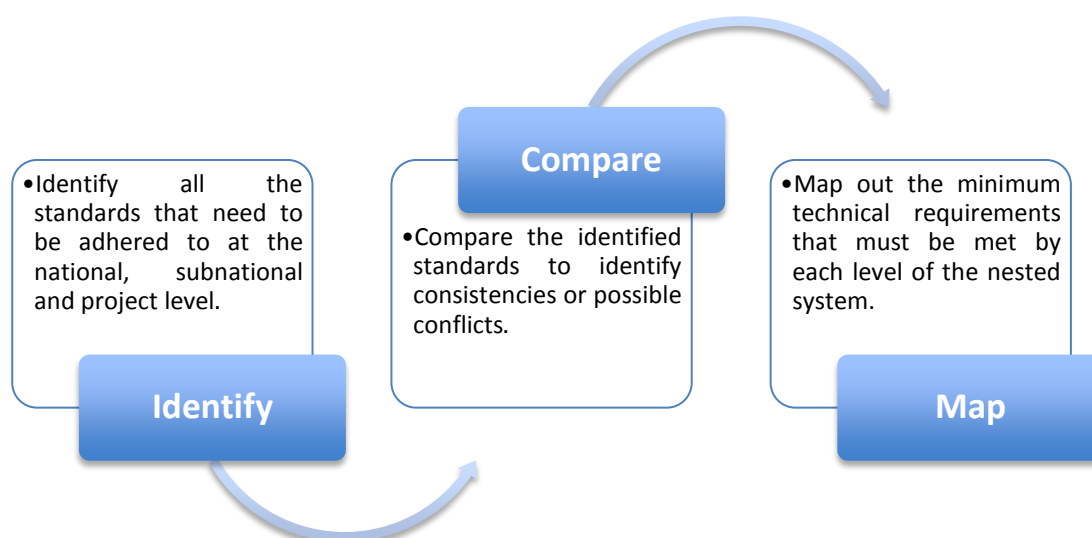


Figure 5: Steps in designing accounting system to meet technical standards

The outcome of this process will be an understanding of the minimum technical requirements to be met at each level of the nested system. Technical requirements will need to be met by activities at lower levels. For example, a national-level requirement for a certain level of accuracy or detail would need to be met by any data flowing into it from lower levels.

Pay careful attention to the rules and requirements of any emission reduction standard or targeted funding source when developing the nesting approach. This document highlights pertinent requirements from the VCS, American Carbon Registry, and the Carbon Fund's Methodological Framework in the footnotes. However, review the most recent version of any standard or funder's requirements to ensure that the combination of choices selected will be in compliance.

Box 6: Meeting multiple standards - The Maï Ndombe Jurisdictional REDD+ and FCPF Carbon Fund Program in the DRC

As with all national programs under the UNFCCC, the DRC must adhere to the UNFCCC's REDD+ guidance and decisions. Additionally, the DRC's pilot jurisdiction Maï Ndombe is applying to the FCPF's Carbon Fund for financing (see DRC, 2014), and thus its accounting methods (among other requirements) must be compatible

with the Carbon Fund's Methodological Framework. Furthermore, the Maï Ndombe program is also pursuing VCS standard validation and verification (since it has an existing VCS REDD+ project embedded in it) and therefore also must follow VCS JNR requirements.

By analyzing how standards at different levels interact as described above, we can see from this example that:

- The jurisdiction's desire to meet VCS requirements and also use DRC's NFMS means that the NFMS will need to meet the VCS's requirements for monitoring.
- The jurisdiction's desire to seek Carbon Fund financing means that the Carbon Fund's strict rules on reference level projection (stricter than VCS or UNFCCC) may have to be followed at both project and national levels.

Table 6: Overview of main international, third-party standard and donor requirements that relate to nesting.

	UNFCCC Warsaw Decision on REDD+ (and later decisions)	VCS JNR Requirements	FCPF's Carbon Fund Methodological Framework
What is it?	A series of decisions that together are referred to as the REDD+ rulebook define how REDD+ must be implemented under the UNFCCC. Later decisions add detail on safeguards, MRV, and RL submission process.	A third-party standard and accounting system that can be used to validate and verify nested programs and issue carbon emission reductions, known as Verified Carbon Units (VCUs).	A set of requirements that any national or jurisdictional REDD+ program must follow if they are seeking to sign an Emissions Reduction Purchase Agreement (ERPA) with the Carbon Fund for results-based payment.
Who does it apply to?	All parties to UNFCCC implementing REDD+ as a climate change mitigation strategy and seeking potential UNFCCC funding.	Any nation or jurisdiction that wishes to either follow the standard in its entirety, or those who want to use its approaches and rules for their own approach.	Any FCPF nation or jurisdiction that wishes to apply to the Carbon Fund. About 5 programs will be funded in total from a fund of about US\$400m.
How does it relate to nesting?	Nesting not specifically discussed, but a nested national approach under the UNFCCC would need to ensure its subnational and project-level activities are all UNFCCC compliant.	JNR requirements were specifically designed to structure an accounting system for nested projects, and cover all elements of a nested REDD+ system.	Nesting is not specifically discussed, but any large-scale program that has programs projects within it would need to ensure that the whole system is compliant with requirements.
What does it cover?	Sets the high-level rules for MRV, RLs, NFMS and finance or results-based payments (as well as other topics such as safeguards).	All technical elements of a REDD+ system.	All technical elements of a REDD+ system. It has more specific requirements than the UNFCCC, but less than the detailed and prescriptive VCS JNR.
Who is using it now?	All UNFCCC parties will be working towards it.	Costa Rica, Peru, Chile, and Acre state in Brazil as well as several other countries and provinces are in various stages of using it.	Chile, Costa Rica, DRC, Ethiopia, Guatemala, Indonesia, Mexico, Ghana, Nepal, Republic of Congo, and Vietnam have produced draft or full ER-PINs for the Carbon Fund. None has advanced to ERPA contract stage yet.
Where	• UNFCCC REDD+ Decision Text	• VCS JNR website contains the	• Carbon Fund website

can I find out more?	<ul style="list-style-type: none"> • Climate Law and Policy Summary of Decisions 	history, pilots, standards, and templates. <ul style="list-style-type: none"> • The JNR requirements • The JNR risk based non-permanence tool • Official guidance (forthcoming) 	contains info on submitted ideas and ER-PINs <ul style="list-style-type: none"> • The Methodological Framework
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Step 2.3: Setting overall objectives of REDD+ accounting system

Integrating subnational accounting systems into national systems is a process of experimental evolution currently underway in many countries. Individual projects and provinces have emerged as early actors, due to visionary leadership, bilateral or NGO technical assistance or funding commitments, or other factors, evident in the examples provided in boxes. Since there are few precedents for how an integrated accounting system should be structured, it is difficult to define a definitive set of methods and a clear outcome at the beginning of the process in a given country context.

One useful starting point is to reach, agreement on a set of objectives to inform the process of integrating of subnational and project level REDD+ into the national accounting system. Defining these objectives will provide direction to those designing the system as well as increase transparency to stakeholders. This is important due to the potential for existing projects/programs to both benefit (e.g., through nationwide monitoring) or incur costs (e.g., through having to adjust accounting methods to harmonize with the national REDD+ accounting system) as a result of measures implemented to allow integration.

Some overarching objectives are likely to be common to all nested systems and have been widely discussed internationally, such as:

- ensuring the environmental integrity of any emission reductions claimed (e.g., conservative estimates of emission reductions, avoiding double counting or significant reversal risks (the non-permanence issue);
- striving for simplicity in accounting procedures;
- minimizing negative impacts on projects or programs being integrated into higher-level programs; and
- achieving economies of scale by harmonizing and sharing systems.

Other objectives may require more consideration, depending on national ambitions and circumstances, such as:

- whether to prioritize national-level data and systems, or to build a nested system from the bottom up, using project- and program-level data and systems (see strong national and subnational-led approaches as described in Part A and in step 3.3 below);
- the extent to which there will be flexibility in accounting approaches at the project and jurisdictional levels (see flexible national approach as described in Part A and in step 3.3 below);

- which donors' and standards' requirements will be followed;
- the accuracy levels that will be targeted; and
- the budget available and how costs will be spread among actors at different levels.

The selection of objectives should be undertaken in a participatory manner, seeking the views of representative stakeholders likely to be impacted by the design of the system. This could be achieved through a consultation process.

STEP 3. DESIGN THE CARBON ACCOUNTING SYSTEM

Objective	Suggested Output
Develop the components of the nested accounting system.	<p>A design for the nested accounting system covering:</p> <ul style="list-style-type: none"> • Broad approach selection • Reference levels aggregation, disaggregation, or integration • NFMS data aggregation, disaggregation, or integration • Rules for inclusion of existing projects or subnational programs • Reversal risk procedures • Leakage procedures • Reporting and verification procedures.

Step 3.1: Decide on a broad approach to nesting

Part 1 of this document describes each of the three approaches to nesting outlined in Figure 6 and the circumstances under which each is appropriate. Based on the results of the assessment in Step 1, a decision should be made about the approach to be followed. This will determine the sub-steps to be followed in steps 3.2 Reference Levels' and 3.3 National Forest Monitoring Systems below.

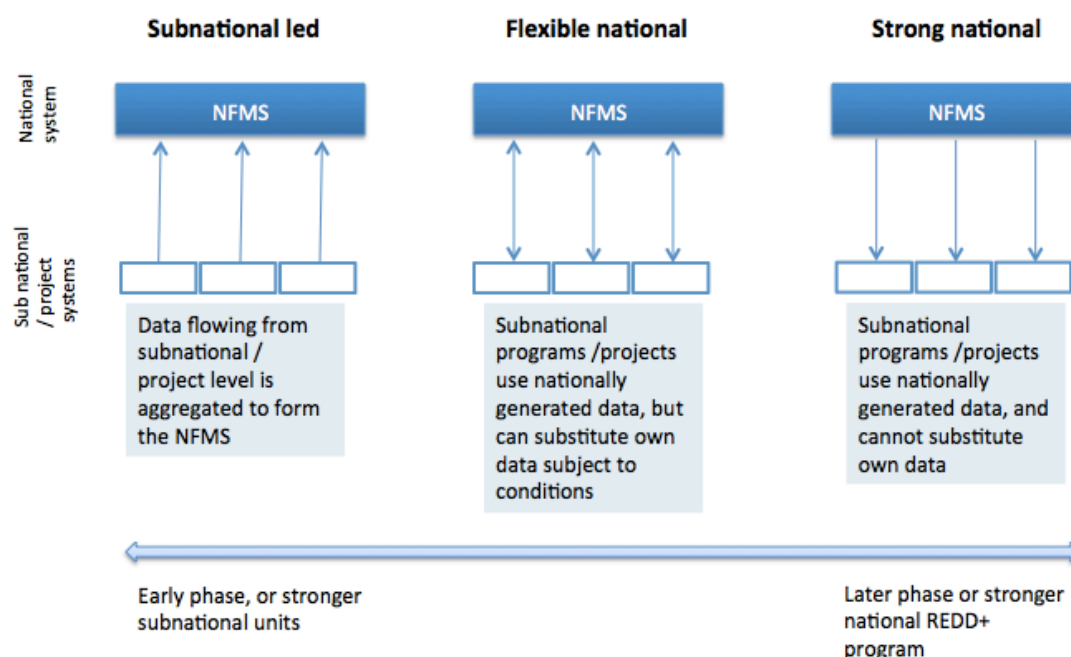


Figure 6: Alternate approaches to REDD+ national and subnational accounting, using the example of the national forest monitoring system (NFMS).

Step 3.2: Set reference levels

The following subsections present possible approaches for aggregating reference levels under a subnational led approach (step 3.2a), disaggregating them under a strong national approach

(step 3.2b) and integrating them under a flexible national approach (step 3.2c). Step 3.4 below provides options for handling existing projects and programs.

Step 3.2a Subnational led - Reference level aggregation

Reference levels are a function of historical activity data, emissions factors and a projection method. Given the variety of methods and data that could be employed to create each of these elements, it is unlikely that any two reference levels would be created using the same method and with the same results, without working together or following the same guidance. Therefore, if reference levels are to be summed to constitute the national reference level, entities need to consider if allowing the use of different methods is acceptable. Three relevant approaches are presented below, ranging from accepting differences, to eliminating them, to the extent possible through technical fixes.

Approach 1 – Accept differences in methods and sum

As long as UNFCCC requirements and guidance are met, then there is no incorrect method for reference level development for UNFCCC purposes, although REDD+ funding or programs usually have other requirements. As such, the separate reference levels could be accepted as they are and simply summed.

This approach may be the most attractive where many subnational reference levels are already being applied to operational subnational projects.

Pros and cons of this approach are as follows:

- ✓ Simple to implement.
- ✗ Large differences in approaches between regions (e.g., historical average projections vs modeling) could raise credibility issues due to the lack of consistency and equity.
- ✗ To cover the entirety of the national area, a reference level for areas not contained within existing subnational reference levels will have to be created.
- ✗ Requirement of various funding programs would need to be harmonized somehow.

Approach 2 – Communicate minimum standard requirements for reference levels

REDD+ programs and projects would be provided with technical standards that need to be met and the timelines for transitioning to them.

- ✓ Allows continued flexibility in approaches at the subnational and project level.
- ✗ Depending on the standard selected, it could still lead to a very wide variety of methods being used.

Approach 3 – Provide nationally developed technical requirements

Requiring certain technical standards to be met will increase the comparability of subnational RLs and allow smoother transition to a nationally consistent method. Technical requirements for reference levels could include elements listed in Table 7 concerning the historical

reference region and projection method, and/or those in Table 8 concerning the NFMS, and also are relevant for emission factors and activity data.

Pros and cons of this approach include the following:

- ✓ If standards are set tightly, then most methodological differences can be eliminated.
- ✗ It will take significant effort to determine the requirements suitable for all subnational areas.
- ! The effort entailed in restricting subnational flexibility may be greater than in creating a national level reference level.

Table 7: Technical specifications necessary to harmonize RLs¹⁰

Element	Technical Specifications
Historical Reference Region	<ul style="list-style-type: none"> Spatial boundary of area used to estimate historical emissions (sometimes called the reference region) relative to the subnational area (for example, the area cannot be beyond its boundaries) or, The rules that must be followed for the use of other areas.
Projection method	<ul style="list-style-type: none"> Allowed methods of projection such as: <ul style="list-style-type: none"> Simple historical averages Moving historical averages Linear projections based on historical trends Non-linear projections based on historical trends Modeled trends based on parameters linked to deforestation (population, GDP etc.)

Box 7: Scaling up from subnational to national reference levels – Brazil

In 2014 Brazil became the first country to submit a forest reference emissions level to the UNFCCC. This reference level covers only the Amazonia Biome which represents over 70% of historical emissions from deforestation in Brazil. Annex 3 of their submission summarizes their progress in compiling reference levels for the other biomes.

Brazil's submission is available at:

https://unfccc.int/files/methods/redd/application/pdf/20140606_submission_frel_brazil.pdf

Step 3.2b: Strong National - Reference levels disaggregation

Programs and projects operating in a country that has adopted a strong national approach will want to know the reference level for the area they are responsible for, so that performance can be assessed and emission ultimately reduced. This is achieved by disaggregating the national reference level and assigning portions to specific areas.

¹⁰ In addition to those in the NFMS table above.

Disaggregation must be done with care as reference levels are often the basis for benefit distribution calculations in REDD+ programs. If a reference level is divided equally between forest areas, areas under no threat would benefit unduly for avoiding emissions while very high-risk areas may receive insufficient emission reductions for efforts made to reduce deforestation.

Three approaches for disaggregating a reference level are presented below. In reality there are many ways to do this, but the aim here is to show the tradeoffs that occur in moving from simple to complex methods. The more complex methods offer greater accuracy and thereby facilitate greater potential for optimization through precise allocation of incentives to areas where emissions are being reduced at the lowest cost. As allocation of emissions will affect allocation of incentives, a transparent and participatory approach is recommended throughout this process.

Approach 1 – Area weighted

The simplest approach is to weight the reference level allocation by area. For example, the amount of deforestation expected in each jurisdiction could be set in proportion to the forest area. Alternatively, emissions could be set in proportion to forest carbon stocks.

Pros and cons of this approach are as follows:

- ✓ Simple and transparent
- ✗ Does not account for relative threat and therefore will not divert incentives towards higher threat areas in favor of less threatened regions.

Approach 2 – Take history into account (average or trends)

Past deforestation or emissions rates could be projected for subnational areas using simple historical averages or trends. In this case the allocation of the reference level would be proportional to the projected emissions.

- ✓ Relatively simple and transparent
- ✗ By not considering the development trajectory of the subnational areas some inefficient allocations may still occur. For example, a state with a low deforestation rate could be given a low reference level, even though its development trajectory suggests its deforestation rate is anticipated to increase soon.

Box 8: The allocation problem: Disaggregation of the Brazilian national reference level

Six Brazilian states have proposed a method of allocating Brazil's national reference level proportion to both the historic deforestation in the states as well as their forest carbon stocks.¹¹ This aims to reward both those states with historically high rates, but also those who have large stocks which could come under threat under business as usual development.

Approach 3 – More sophisticated methods using modelling or threat analysis

More sophisticated methods could be employed to determine more precisely the spatial distribution of deforestation threats, based on historic data analysis and modelling of national development patterns. This would require extensive consultation, technical input and modelling.

- ✓ Most likely to efficiently allocate the reference level
- ✗ Could take considerable time and resources, and may be limited by data availability
- ✗ Complex methods could lack transparency
- ✗ Process could become politicized.

Box 9: Harmonizing reference levels – Brazil

In June 2014 Brazil became the first country to voluntarily submit a Forest Reference Emission Level to the UNFCCC for expert assessment.¹² This FREL was subnational – covering the Amazon Biome and using historic satellite data going back to 1996 to establish a FREL for deforestation (but not including forest degradation). The FREL was created by projecting a dynamic mean of CO₂ emissions from gross deforestation associated with deforestation over the previous 10 years, updated every 5 years (a rolling average).

The challenge now facing Brazil is to integrate reference levels being established or already established by states and projects within the Amazon biome, which have been constructed using different methods. A proposal by six Amazonian states on allocation of REDD+ responsibility and emission reductions among the federal government and states is based on the national reference level, but employs a non-dynamic mean that does not ratchet down every 5 years. This leads to a significantly higher reference level. It also highlights the policy implications of virtually all RL allocation decisions.

The Brazilian federal government, states and nested projects will need to agree upon a consistent method for setting reference levels or account for any differences that result from divergent approaches.

Step 3.2c: Flexible National - Reference level integration

A flexible national approach to reference levels entails the same considerations as designing a strong national system (see step 3.2b above), with the addition that conditions for integrating

¹¹http://www.gcftaskforce.org/documents/contributions_national_REDD+_strategy_proposal_allocation-state_union_EN.pdf

¹² https://unfccc.int/files/methods/redd/application/pdf/20140606_submission_frel_brazil.pdf

reference levels from programs or projects into the national system need to be set. Therefore three additional steps would be required:

1. Decide on the technical requirements for reference level integration

Methods permitted for reference level creation will need to be defined, including the reference area that can be used, the historical data that may be included, and the projection methods allowed (see 7 above). Step 3.2a on subnational led reference level aggregation should also be referenced for the relevant considerations.

2. Decide on the procedures for assessing the data

A process would need to be established to review submitted reference levels and determine acceptability. This would probably need to be supported by a technical panel, which may or may not be independent of the government. The process for this procedure including submission periods, submission requirements, assessment criteria, timelines and details of the assessment period will all need to be documented and publicized.

3. Decide on a schedule for incorporating RL data

In order to make the system manageable, set periods for submitting reference levels for inclusion would need to be defined. Following assessment, data could be incorporated in time for scheduled national reporting.

Step 3.3: Design National Forest Monitoring System (NFMS)

Step 3.3a: Subnational-led - Aggregating data to form a NFMS

A subnational-led NFMS would constitute the sum of the forest monitoring systems operating at the subnational level. It is likely that such forest monitoring systems would contain the following components:

- **A forest inventory** – A stratified forest stock data set and map of forest types used as the starting point for measuring land use change.
- **A forest change monitoring system** – usually a satellite-based land cover classification and change detection system that can track year to year changes in land use, and/or forest inventory data. May be complemented by indirect change detection methods including surveys. This system generates **activity data**.
- **A greenhouse gas inventory** – a comprehensive estimate of GHG emissions by source, containing carbon stock data and **emissions factors** associated with land use changes. Uses inputs from the forest change monitoring system to calculate emissions at each monitoring event.

The assessment of ongoing REDD+ activities detailed in Step 1 will have revealed commonalities between the forest monitoring systems of existing subnational jurisdictions

and projects in terms of the technical specifications in Table 8 below. In order to build a bottom-up NFMS, each component system must, at a minimum, meet the technical standards required (see step 2.2). This monitoring data would need to be compiled centrally, since only national government focal points perform reporting to the UNFCCC.

Table 8: Technical specifications to be determined in building a NFMS.

Elements	Technical specifications
Forest inventory	<ul style="list-style-type: none"> • Minimum mapping unit (resolution) • Land use strata • Geographic units for which estimates will be made • Year of most recent data collection
Forest change monitoring system	<ul style="list-style-type: none"> • IPCC approach to change detection (Approach 3, geographically explicit land use change tracking is the most likely to be chosen)¹³ • Allowable direct (remote sensing or forest inventory) and indirect (survey or harvest records) detection methods • Allowable remotely sensed data sources (e.g., which satellite source) • Allowable data processing methods • Accuracy of forest/non forest classifications¹⁴ • Minimum mapping unit (resolution) • Minimum monitoring frequencies • Treatment of cloud cover
GHG inventory	<ul style="list-style-type: none"> • Activities reported • Minimum IPCC tier of data gathering (may vary) • Carbon pools included • Standard operating procedures for sampling and plot design • Standard operating procedures for sample analysis (e.g., soil carbon analysis) • Allowable allometric equations, biomass expansion factors, root: shoot ratios and procedures for creating new ones • Carbon fraction number(s) used • Accuracy and precision thresholds • Accuracy and uncertainty calculations (should follow IPCC guidelines)

Where minimum requirements are not met, programs and projects will need to adapt their approaches. At this stage, national and subnational governmental agencies and other key actors in REDD+ programs may seek to further harmonize monitoring systems to facilitate smooth integration into a fully national system.

Subnational-led NFMS design can be guided either by communicating the standards that the system must meet, or communicating a set of specific technical specifications that they must meet. Both approaches are likely to require standardized guidance documentation to be produced and the provision of appropriate training for program and project staff.

¹³ See section 2.3 of http://www.ipcc-nggip.iges.or.jp/public/gpplulucf/gpplulucf_files/Chp2/Chp2_Land_Areas.pdf

¹⁴ VCS require 75% minimum VCS AFOLU Requirement 3.14.11

Approach 1 – Communicate standards that forest monitoring systems must meet

REDD+ programs and projects would receive instructions about the technical standards that need to be met and the timelines for transitioning to them. For example, programs could be instructed that they must all meet VCS JNR standard requirements as well as those of the UNFCCC.

- ✓ Ensures that particular standards of monitoring are met, allowing access to the relevant market or donor funds
- ✓ Auditing of the approach could be done through the standard's own systems, reducing the effort for the country
- ✓ Allows continued flexibility in approaches at the subnational and project level
- ✗ Could simply be postponing the critical major changes needed by programs and projects in order to build a fully integrated NFMS
- ✗ Although a common standard may have been met by different systems, the methods used could be very different, making integration of the data into one set of results more difficult.

Approach 2 – Communicate specific technical specifications that forest monitoring systems must meet

Setting specific technical requirements ensures that monitoring data are easily integrated (see Table 8 above). The requirements should be set in a participatory manner so that the knowledge, experience and capacity of those operating forest monitoring systems can inform the design of the national system. Guidance materials and capacity building will need to be created to support program developers in meeting the requirements. Upon introduction of technical specifications, it may be necessary to continue collecting data with old protocols until factors for converting between old and new numbers can be developed.

Pros and cons include:

- ✓ Moves all programs/projects significantly closer to integration
- ✗ Could be burdensome to programs/projects will significantly different approaches
- ✗ If the requirements are very strict, it may be more efficient to develop a central forest monitoring system, rather than creating multiple similar sub-systems (see strong national and flexible national approaches to NFMS below).

Box 10: Bottom-up creation of monitoring systems - Cambodia

In 2013 a review of the institutional arrangements and methodological approaches used in REDD+ project activities in Cambodia was undertaken to evaluate commonalities and divergences in order to provide decision makers and stakeholders with information on how current REDD+ activities can be integrated into a national framework.

After reviewing three project level REDD+ monitoring systems, the review report recommended that project-level monitoring data could be compiled to the jurisdictional level, due to the degree of commonalities in approaches including:

- tier 3 activity-based stock change accounting,
- field-based sampling of forest carbon stocks (note that all projects employ the same minimum diameters, forest strata, allometric equations and carbon fraction of biomass), and
- monitoring land use change via analysis of classified satellite imagery (all project employed Landsat imagery).

It also recommends that further guidance to projects on issues such as minimum mapping units for remote sensing analysis and minimum field quality standards, as well as synchronizing the timing of project-level and jurisdictional MRV, will further facilitate such integration.

The report can be downloaded here: www.leafasia.org/library/survey-and-analysis-redd-project-activities-cambodia

Step 3.3b: Strong national - NFMS data dissemination process

Under a strong national system, data will flow from the NFMS to lower-level programs or projects, and not vice versa. Based on the assessment of existing activities under Step 1, the monitoring requirements of existing programs or projects should be known and the NFMS should seek to provide that data. Where it cannot provide necessary data (due to the specific requirements of programs or projects being beyond the capability of the NFMS), or if the NFMS is under development, step 3.4 on the 'Rules for existing programs or projects' should be consulted in designing a mechanism for managing the program.

Dissemination of spatially defined data (such as land areas that have undergone deforestation and associated carbon emissions) to spatially defined programs should be straightforward. For example if deforestation is monitored in a wall-to-wall pixel-based system at the national level, results derived from pixels within a specific program or project area can be provided to the individual programs or projects.

For non-spatially defined data, a procedure for allocating the data to spatially defined programs will be required. For example, if surveys in the capital city reveal increased consumption of charcoal, which is linked to increased degradation, it may be unclear how to allocate this activity data and associated emissions to surrounding programs. Such an allocation method could use weightings based on parameters such as:

- area of forest that could provide the resource,
- implementation level of activities to prevent or discourage the emissions detected,
- proximity to locations where emissions were detected, and
- historically recorded sources of those emissions.

Step 3.3c: Flexible National: Integration of data into NFMS

A flexible national system will require all the same considerations as designing a strong national system (see step 3.3b above). The added element is that the conditions under which lower-level data from programs or projects are integrated into the national system will need to be set. Therefore three additional steps would be required:

1. Decide on the technical specifications for lower-level data acceptance

In order to ensure that data provided by lower level programs or projects can be integrated a set of technical specifications for the type of data that can be accepted will need to be defined. Table 5 can be used as a starting point for drafting these. Allowing a wider range of data to be input into the NFMS will improve its responsiveness to lower level data, but may also make the NFMS more complicated to operate.

2. Decide on procedures for assessing the data

A process would need to be established to review submitted data and determine its acceptability. The review would likely be conducted by a technical panel, which may or may not be independent of the central government. The process for this procedure including submission periods, submission requirements, assessment criteria, timelines and details of the assessment period will all need to be documented and publicized.

3. Decide on a schedule for incorporating the data

To simplify administration, set periods for submitting data for updates would need to be defined. Following assessment, and depending on timing, the data could be incorporated in scheduled national reporting.

Box 11: A Flexible National Approach to a National Forest Monitoring System (NFMS) - The Maï Ndombe Jurisdictional REDD+ Program in the DRC

This example illustrates how national MRV systems can be designed both to provide information to projects and jurisdictional programs, but also to improve its accuracy by incorporating lower-level, higher-accuracy data.

The DRC has adopted a national approach to REDD+ based on a combination of national systems development and pilots at the jurisdictional level. Under this approach, an FCPF Carbon Fund Emission Reductions (ER) Program is being developed in the Maï Ndombe region of the DRC (see DRC, 2014). The jurisdictional program is being designed to be compatible with, and nested into, the national program. In addition the Maï Ndombe region already has an operational 248,956 tCO₂e REDD+ verified VCS project¹⁵ that needs to be nested into the Maï Ndombe ER program. The Maï Ndombe region covers 12.3m hectares, 8.2 million of which are forested. The project aims to reduce deforestation 50%, implement reduced impact logging and afforestation/reforestation activities. Their efforts to address deforestation will focus on slash and burn agriculture, wood energy production, uncontrolled bushfires, industrial logging and illegal artisanal logging.

The DRC's NFMS is managed by the Ministry of the Environment, Conservation of Nature and Tourism (MECNT) in collaboration with the Food and Agriculture Organization of the United Nations, JICA and the Brazilian space agency INPE. It has a web interface where all data can be viewed (<http://www.rdc-snsf.org/>) and is expected to be used by the Maï Ndombe pilot jurisdictional program.

In its combined roles the NFMS must have the capability to report sufficient detail for the jurisdictional program and also integrate data from the program, its nested REDD+ projects and also forest concessions, protected areas and mining concessions, etc. within the jurisdiction. The Figure 7 below shows the proposed architecture

¹⁵ The Maï Ndombe REDD+ project, developed by Wildlife Works was validated and verified in 2012. See here for more details: <https://vcsprojectdatabase2.apx.com/myModule/Interactive.asp?Tab=Projects&a=2&i=934&lat=-1%2E659042&lon=17%2E893816&bp=1>

of the NFMS and how data from the program participants flows into the NFMS.

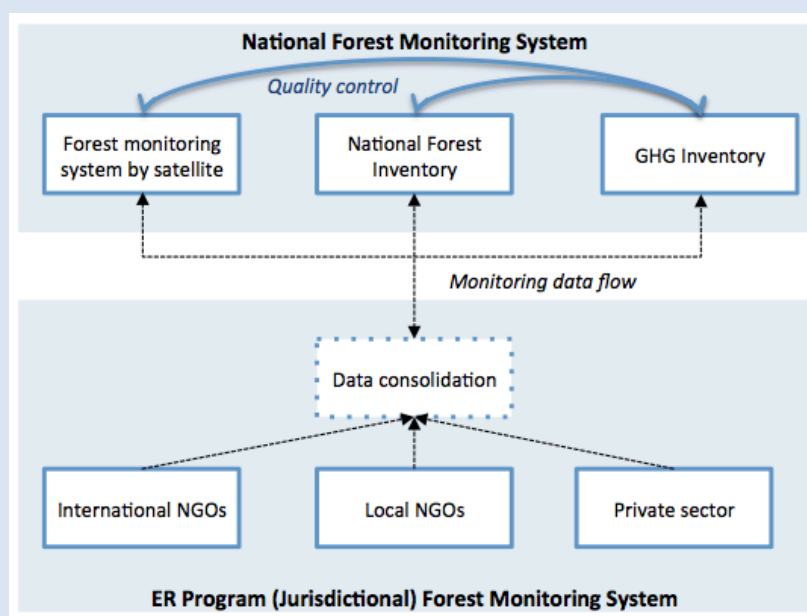


Figure 7: Simplified schematic of the proposed method for integrating the Maï Ndombe ER Program into the NFMS. Adapted from the DRC Maï Ndombe ER-PIN, in DRC, 2014.

The NFMS is based on three pillars. The way in which subnational programs or projects can integrate with each of these is explained below:

Pillar 1: Satellite Land Monitoring System

The ER program will use and build upon the national TerraCongo system, part of the remote sensing used for the NFMS which uses Landsat, FACET, and a land cover map from the Catholic University of Louvain to detect forest cover change and supplement this with higher-resolution data of its own. This data would then replace the data in the NFMS for the ER Program area.

Pillar 2: The National Forest Inventory (NFI)

The National Forest Inventory requires a comprehensive land cover map for stratification of sampling activities. Such a map has been produced by MECNT for the national pre-inventory. At the ER Program level, a finer stratification could be considered for establishing specific emission factors. As new data become available (e.g., LiDAR data from WWF), they will be assessed and incorporated into the NFI and used to continually assess stratification quality.

Pillar 3: The National Greenhouse Gas Inventory

The greenhouse gas inventory estimates and defines the carbon stocks associated with different land cover strata and hence the emissions associated with land use change. The ER Program will use standardized methods for defining carbon stocks that comply with a Tier 2 approach under the IPCC 2006 guidelines. Data generated for the NFI and also by ER Program stakeholders such as the Maï Ndombe REDD+ Project, Novacel's South Kwamouth project and WWF's "REDD+ for People and Nature" will be used to define carbon stocks along with the carbon map and model described previously. It is envisioned that these datasets may be used for calibration and/or verification of per-stratum carbon estimates.

Step 3.4: Set rules for existing projects and/or subnational programs

To avoid sudden changes that could undermine investor and implementer confidence, a grace period could be provided to projects and programs to allow time to adapt to requirements of a national integrated carbon accounting system.¹⁶ Depending on the scale of changes needed, a period of 1-5 years may be appropriate. The end of the grace period could be set to align with the renewal date for subnational program and project reference levels (assuming such a date is mandated).

A number of options exist to handle carbon accounting overlaps during the grace period:

1. deduct emission reductions earned by lower-level programs from the national total, or
2. cap the emission reductions that lower-level programs can claim, or
3. remove lower-level areas from national accounting, or
4. incorporate lower-level data temporarily.

Approach 1 – Deduct emission reductions earned by lower-level programs from the national total

Total emission reductions are first calculated using the national reference level and monitoring program ignoring any overlapping programs. Sub-programs and projects then submit claims for emission reductions during the national monitoring period. These emission reductions are then subtracted from the national total.¹⁷

Pros and cons associated with this approach include the following:

- ✓ A quick approach to nested accounting challenges.
- ✓ Transparently avoids double counting.
- ✓ Avoids changes to subnational program and project reference levels or accounting methods.
- ✗ In cases where the lower levels have been allowed significantly more aggressive reference levels (e.g., modeled vs. historic averages), the national program could lose a significant proportion of emission reductions and with them the benefits that have been rightfully earned.
- ✗ Subnational programs or projects do not benefit from national data collection and processing efforts.

¹⁶ VCS JNR Req. 3.11.13 requires that jurisdictional level reference levels are 'grandfathered' for a period of 18 months if a national level reference level is set above it. Projects are allowed to continue to use their baselines until they next need to be updated, which could be a maximum of 10 years.

¹⁷ This approach is suggested under VCS JNR Req. 3.6.4.

Approach 2 – Cap the emission reductions that lower-level programs can claim

To ensure that there is no double counting while allowing subnational programs time to adjust to the national level system, a cap on the emission reductions claimed by lower level REDD+ activities could be established. This cap could be based on the emission reductions for the area based on national monitoring relative to the national reference level. Compensation for any lost revenues could be considered to ensure that the value of the emission reductions is sufficient to cover implementation costs.

Pros and cons associated with this approach include the following:

- ✓ A simple method to ensure no double counting is possible.
- ✗ A cap could make some programs unfeasible as currently designed and financed; this would send a very negative signal to investors.
- ! Consultation with affected programs, projects and their funders is advised to determine the impact a cap on emission reductions would have.

Approach 3 – Remove lower-level area from national accounting

Subnational or project REDD+ activities with the same scope as the national REDD+ program could be allowed to continue independently, and would not contribute to nor use the data derived from the national forest monitoring system¹⁸. Likewise, they would not use the national reference level, nor contribute data to its development.

- ✓ A quick approach to nested accounting challenges.
- ✓ Avoids changes to subnational programs and project reference levels or accounting methods.
- ✗ May lead to disparities between regions in terms of reference levels and measured results.
- ✗ Avoids rather than solves any issues, and may not count as a true national approach to REDD+, so would only be accepted by UNFCCC as a transitional sub-national approach.
- ✗ Subnational programs or projects do not benefit from national data collection and processing efforts.

¹⁸ This approach may face difficulties under the VCS JNR standard. The intention of the standard is that all areas within the national borders (for a national level program) have a baseline set for them, are monitored, and there are no gaps in coverage of land (3.5.4). The presence of an existing project or program is not an allowable exclusion criterion for reducing the area of a national program (3.5.4) or for not monitoring it (3.14.6). However if right of use cannot be demonstrated due to an existing program or project, this may be a mechanism under which they could be excluded from accounting (3.6.1, 3.6.2). The VCSA should be consulted before any decisions are made regarding this approach if the VCS JNR is being followed.

Approach 4 – Incorporate subnational/project level data temporarily¹⁹

Forest monitoring data and/or reference levels from subnational programs could be incorporated into the national system as-is, on a temporary basis. This would constitute a temporary version of the Flexible National System described earlier in the document.

- ✓ Favorable for projects and subnational programs, that are not required to make any changes.
- ! It is technically complex to integrate the data (see Flexible National system section).

Box 12: The challenge of nested reference levels: Quantitative example

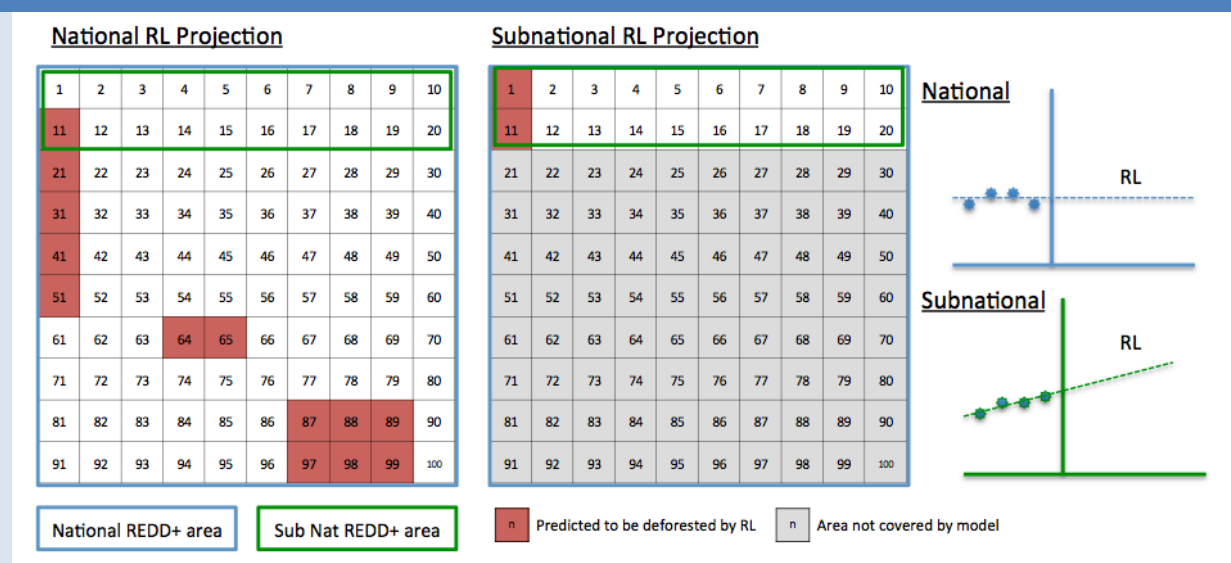


Figure 8: national vs. subnational quantitative example

The challenge

In the simplified example in Figure 8, a country is divided into 100 areas, referred to here as pixels. The national reference level estimates in 10 years that 13 pixels would be deforested in the country, with 1 pixel falling in the subnational area. The subnational area's RL is based on more detailed local data and predicts 2 pixels will be deforested during that period.

If we assume 1 pixel represents 100t CO₂ of emissions and both programs were 100% effective, then the national-level accounting shows 1,300 t CO₂ of avoided emissions, 100 t CO₂ of which is from the subnational area. The subnational area would show that 200 t CO₂ of emissions were avoided in that area alone.

Carbon accounting solutions in a Strong National System

The impact of immediately imposing a national reference level on the subnational area may have serious consequences if the subnational area had already agreed to carbon emission reduction sales based on that reference level. Therefore under the strong national system, a grace period is suggested as a way to phase in a

¹⁹ VCS JNR Req. 3.14.4 states that incorporating lower-level monitoring data is best practice. However the JNR allows higher-level programs to decide which level of data takes preference when there is a discrepancy. This decision can be updated after each monitoring period (3.14.5)

national reference level (or NFMS) over time. During this grace period there are two approaches (1, 3 and 4 above) designed to minimize the impact on subnational programs.

The first, approach 1, involves deducting the emission reductions claimed by the subnational area from the national accounts. In this case it would involve keeping the nationally calculated emission reductions at 1,300 t CO₂ but assuming that 200 t CO₂ came from the subnational area, and 1,100 t CO₂ from the rest of the country. This would make emission reductions available to the rest of the country, but allow the national RL to be preserved.

Approach 3, involves excluding the subnational area and the remaining area would have a RL of 1,200 t CO₂.

Finally, approach 4, involves temporarily incorporating the subnational reference level (like in a flexible approach). The national reference level would be amended to be 2 pixels for the subnational area and 12 pixels for the rest of the country, totaling 14 in all. The avoided emissions would be 200 t CO₂ from the subnational area and 1,400 t CO₂ for the country. This would not reduce the emission reductions for any party, but the nationally calculated reference level would not truly be in use until the grace period ended.

Step 3.5: Decide how to manage reversal risks

The aim of the nested reversal system first must be to address the issues of the non-permanence and the environmental integrity of any emission reductions claims. Secondly, there must be a system for detecting, reporting and assuming responsibility for any reversals of claimed emission reductions that occur in the nested system.

At the project level, risk buffer approaches are commonly used, whereby a risk assessment is used to determine what portion of emission reductions are reserved in a buffer account. Buffer emission reductions are cancelled if a project's emission reductions are reversed. Insurance programs have also been piloted for specific risks.²⁰

At the national level the UNFCCC's Cancun Safeguards require that when undertaking REDD+ activities, "there are actions to address the risk of reversals," but what these actions are has not yet been defined. It is likely national actions would need to:

- minimize the risks of reversals through good program design,
- identify reversals through monitoring, and
- ensure the integrity of any emission reductions that are issued (through a buffer mechanism or insurance scheme that can finance the purchasing of replacement emission reductions).

Here we focus on the second two points, which are accounting issues. The challenge is to design a system that places the responsibility of addressing the non-permanence of emissions reductions on whomever is most able to ensure it, and then incentivize them accordingly. Where non-permanent systems already exist at the project or program level within a country, these will need to either be incorporated into or replaced by the national system.

²⁰ For example the political risk insurance provided by OPIC to the Oddar Meancheny Project in Cambodia: <http://www.opic.gov/press-releases/2011/opic-signs-first-insurance-contract-redd-carbon-reduction-project>

Rules and procedures needed

To address the risk of reversals occurring at all levels of the accounting system, the following two system components will be required.

(a) Measurement and monitoring at each level in the nested system

A system for monitoring reversals, and capable of attributing reversals to underlying programs, will need to be defined within the NFMS. The system will prescribe when and how suspected reversals need to be reported.²¹ Reversals may be measured through the NFMS relative to the reference level using activity data. In order to attribute the reversal to a subnational program, the NFMS and RL will need to be disaggregated to the program level, as described in step 3.2 above.

(b) A system to ensure the environmental integrity of any emission reductions issued

To ensure the environmental integrity of any emission reductions issued, there first must be identification of where reversals took place. A system is then required to safeguard the integrity of any issued emission reductions in the face of a reversal at any level. The system employed will be heavily influenced by requirements of the standard or funder, if any. Two possible approaches are presented here.

Approach 1: Use a buffer system that has been established by a standard or funder such as the VCS or the FCPF Carbon Fund (in design).

The VCS JNR standard has a non-permanence risk tool that programs are required to use. It involves conducting a non-permanence risk assessment and then, based on the outcome, allocating a number of the emissions reductions verified into a pooled risk buffer account rather than issuing them as VCUs. In the case of a reversal of emission reductions, this buffer pool can be drawn upon. The Carbon Fund's Methodological Framework states that such a system is currently being designed specifically for its programs, although programs can choose to use their own buffer approach or insurance. Pros and cons associated with this approach include the following:

- ! Only suitable with the acceptance of standards or funders at all levels in the national nested system
- ✓ Does not require additional design work
- ✗ Potential loss of sovereign control over the system.

Approach 2: Develop a national system.

A country could decide to design its own mechanism. Such a system would likely have to involve some form of risk assessment and set aside of emission reductions or funds for the

²¹ VCS JNR Req. 3.15.6 explains the system under VCS that must be followed to report loss events that may lead to a reversal. The Carbon Fund's Methodological Framework requires there is monitoring capable of identifying reversals (21.2) and that they are reported within 90 days of being detected (21.2). Any nested monitoring system under the Carbon Fund would therefore need to pass these requirements onto lower-level monitoring systems.

purpose of ‘truing up’ and reversals encountered. This may be an attractive option if risk assessment processes operated by third parties are not suitable given country circumstances. It also provides flexibility in what emission reductions are allocated to the buffer.

Box 13: Example – Designing a more efficient risk buffer pool

In the VCS system, countries are required to set aside and not sell a percentage of each year’s emissions reductions. Each year a portion of emissions reductions is placed in a buffer account. An alternative approach could be to place emission reductions of an older vintage into a buffer account. The advantage of this approach is that although all vintages of emission reductions represent the same thing – a tonne of emissions reductions--buyers often prefer newer vintages. This would allow a buffer to be established at a lower cost with no loss of environmental integrity, assuming older vintages are receiving a lower price on the market.

Pros and cons associated with this approach include the following:

- ✓ Could employ a range of approaches such as buffer pool contributions and insurance.
- ✓ May be necessary where existing subnational and project REDD+ activities are following different standards and approaches to reversals.
- ✓ Would allow flexibility in approaches among national, subnational and project levels.
- ✓ Allows countries to tailor the risk assessment to their own country context
- ✗ Buyers of emission reductions will need a clear demonstration that the system is robust enough to ensure environmental integrity of the emission reductions/
- ! Has not been done before and is inherently complex.

Step 3.6: Decide how to manage leakage

Managing leakage within national programs amounts to ensuring that projects or subnational jurisdictions do not receive compensation for reducing emissions that are subsequently emitted elsewhere. When a nested system has multiple programs, leakage accounting and allocation of responsibility for leakage is complex. It can be difficult to know whether to attribute deforestation to the failure of a project to control leakage or to the failure of the program where deforestation occurs.²²

The approach to managing leakage will vary depending on whether or not there is a national REDD+ program in place that has complete coverage over the country.

Under a national REDD+ program with complete national coverage

Under a national REDD+ approach with national monitoring, the monitoring would detect emissions across the whole area and hence any leakage, but it would not be possible to detect

²² VCS JNR Req. 3.12.8 requires that emissions which leak into neighboring VCS program areas do not need to be accounted for and are the responsibility of the program area in which they occur.

it as such. Emissions detected in one location could be a failure of the REDD+ activities there, or could be due to leakage from outside of the jurisdiction or country, or some combination. Since attribution would be exceptionally difficult, if not impossible, it would be simplest for all areas to assume responsibility for their own emissions.

The only necessary requirement would be that programs under a national REDD+ program identify and minimize the possibility of leakage to the satisfaction of the national REDD+ program. For example, subnational programs nested within a national program could be required to demonstrate on an annual basis that they have implemented their leakage mitigation strategies successfully. A percentage of emission reductions could be surrendered as a penalty for failing to do this. A simple rating scale could be defined to outline the percentage of leakage emission reductions to be surrendered by the program should they be unable to demonstrate that their activities have successfully produced the reductions. Surrendered emission reductions could be held centrally by the national program or redistributed to other areas.

Under a national REDD+ program without complete national coverage

In a scenario where the national REDD+ program is incomplete in spatial scale, leakage of emissions into the areas not covered by the program would need to be accounted. This leakage will need attribution to the national or a subnational program, so that their claims of emission reductions do not exceed what is measured at the national level. Three approaches are proposed here for leakage accounting.²³

Approach 1: Full leakage accounting (e.g., following VCS Leakage Tool, full project leakage accounting)

At each level of a nested REDD+ accounting system, each program or project would be required to undertake an independent leakage assessment, to quantify leaked emissions, and to deduct their value from its claimed emission reductions at each monitoring event. Under this approach, in theory all leakage into areas not covered by the REDD+ program would be accounted. This could, however, lead to double accounting of leakage – where two or more programs assume responsibility for emissions in an area not covered by the national REDD+ program. While this is inefficient, it is at least conservative. Pros and cons associated with this approach include the following:

- ✓ Would fully estimate relative leakage and lead to equitable benefit distribution.
- ✗ Attribution of leakage can be difficult when the leakage areas of one or more projects or programs overlap. This could be difficult to resolve among programs, or if it is not resolved, lead to double counting of leakage.

²³ VCS JNR Req. 3.12.9 requires that if there is a national system for leakage allocation, VCS lower level programs must use it. 3.12.9 requires that projects must use the system required by any jurisdictional program above them. This gives complete power and flexibility to the highest-level program (national), but 3.12.10 reminds proponents that stakeholder consultation is required to design the system.

Approach 2: Flat leakage tax

Apply a flat leakage “tax” or discount to all participating program and projects. The “tax” could be payable in emission reductions or cash and be directly proportional to emission reductions claimed. The “tax” could be set in advance of leakage monitoring at a level considered sufficiently elevated to capture any leakage, or it could be set after leakage monitoring such that the exact amount could be distributed to parties. Pros and cons associated with this approach include the following:

- ✓ Would protect higher-level jurisdictions against over-allocating emission reductions to nested elements.
- ✓ Very simple.
- ✗ Does not incentivize investment in leakage reduction strategies.
- ✗ Is arbitrary, leading to some areas being unfairly penalized and others being over-allocated.
- ✗ Risk exists that the “tax” will not be sufficient to cover leakage if set in advance of monitoring.

Approach 3: Leakage risk assessment with relative deduction

Where the amount of leaked emissions in areas not covered by the national REDD+ program is quantified through monitoring, a leakage risk assessment could be conducted on REDD+ programs and projects, to determine what proportion of responsibility each should bear for the leakage. Pros and cons associated with this approach include the following:

- ✓ A quick approach to nested accounting challenges.
- ✓ Avoids changes to subnational programs and project reference levels or accounting methods.
- ✗ May lead to disparities between regions in terms of reference levels and measured results.
- ✗ Avoids rather than solves any issues, and may not count as a true national approach to REDD+, so would only be accepted by UNFCCC as a transitional sub-national approach. Would be fairer than a flat “tax” and relatively inexpensive.
- ✗ The choice of relative risk boundaries and relative deduction would be arbitrary.

Step 3.7: Define reporting and verification procedures

Step 1b above will have identified the variety of reporting requirements to which the programs or projects within the nested REDD+ system are required to adhere. At a minimum these are likely to be as follows:

- National level
 - UNFCCC biennial national communications²⁴ and associated REDD+ reporting and technical annex.
 - Periodic reporting to bilateral donors.
 - Periodic reporting to multilateral donors such as UN-REDD and FCPF.
- Subnational level
 - Periodic reporting to multi-lateral donors or purchasers of ERs such as FCPF Carbon Fund.
 - Periodic reporting to voluntary carbon standards such as VCS.
- Project level
 - Periodic reporting to voluntary carbon standards.

In addition there also may be requirements to report between levels, for example, for projects to report to their subnational jurisdiction.

The first task is to map out all the reporting requirements that currently exist, before building a reporting system that meets all the requirements.

Planning for reporting can begin by working backwards from what is required by the national communication and REDD+ reporting to the UNFCCC or other international initiatives, in terms of scope, level of detail and frequency. Nested reporting beneath this must then be required to provide *at least* that same level of information, and in enough time to be integrated into higher-level reporting. The complexity of this system will depend on the approach taken:

Strong national approach: All monitoring data is generated centrally by NFMS, so coordination is not required with lower-level programs for reporting on matters related to carbon accounting. Coordination may be required on other matters, such as safeguards activity reporting.

Flexible national approach: Monitoring data will flow from lower levels to the NFMS ready for reporting. Therefore reporting on this data will need to be coordinated with enough time available for the results to be brought into national reporting.

Subnational-led approach: The reporting from subnational programs will need to be coordinated to arrive in time for national reporting.

The timing of reporting or verification may not align between agency- or donor-specific protocols. Agree on such timing in advance, and approach donors or others to accept harmonized reporting to reduce institutional and financial burdens and enhance consistency and comparability of data reported over time. This could be achieved through a workshop attended by those who report, and those who require or receive reported information.

²⁴ http://unfccc.int/national_reports/non-annex_i_natcom/items/2716.php

Verification

Most REDD+ projects now incorporate third-party, fully public verification that adheres to a high level of stringency. Countries may not have experience in such third-party verification of program outcomes at the national level. Thus this approach may prove controversial or challenging to forest and other government agencies protective of public data, remote sensing imagery, or their ultimate authority on land ownership and use issues. Continued dialogue between donor and recipient governments, in particular at the UNFCCC level, will be required to arrive at an approach for verifying results that respects a country's sovereignty but also provides donors or purchasers of emission reductions with the confidence they need.

STEP 4. PLAN AND PRIORITIZE THE NESTING ROLL OUT

Objective	Suggested Output
Understand the cost, timelines and implications of rolling out the system.	A plan for implementing a nested system roll out.

4.1 Compose complete nesting plan documents

On completion of Step 3 there should be:

- Understanding of the situation of programs and projects in the country;
- A set of nesting objectives; and
- A design of the nesting architecture.

At this point it is necessary to construct the nesting plan for subsequent roll out and implementation.

For simplicity and utility it will make sense to have separate nesting plans: one for projects and one for subnational jurisdictions (where relevant). Thus each can pick up the relevant nesting plan and understand requirements and responsibilities. The documents must clearly provide both a clear set of rules *and* a tool for practitioners (subnational governments or private project developers) to understand the core foundations on which programs must be developed.

To optimize the value as a tool, presentation is very important. The document should be user friendly and accessible.

Box 14: Recommended contents of a nesting plan

- Summary of REDD+ strategy at the national level and vision for a nested accounting system
- Summary of the steps taken to design the nesting plan
- The technical requirements or standards that subnational programs or projects will need to adhere to, including how performance against the RL will be monitored, and how subnational RLs and emission reductions will be integrated into the national RL and MRV system
- The technical benefits programs or projects will receive (e.g., access to NFMS data) and associated timeline
- The timeline for the technical requirements being met, as well as any procedures during grace or interim periods before full implementation
- The technical support and financing available to support the transition
- Capacity building program description
- Contact details and grievance mechanism.

4.2 Seek stakeholder input and revisions

A consultative process will be required in order to achieve success. This process ideally should be implemented throughout the design of the nesting plan. Key stakeholders will be the subnational governments managing the subnational jurisdictions, project developers, civil society, and representatives of affected communities and indigenous peoples.

4.3 Prioritization of roll out

The final decision to be made is how to implement the plan.

Approach 1: Immediate roll out and implementation

The nesting plan is immediately rolled out and implemented. A grace period may still apply for projects already in existence.

- ✓ Immediate conformance avoids ever-greater divergence between country plans and reality that will be hard to reconcile later.
- ✗ Burdensome to existing programs and projects which must immediately adapt and adjust to kinks and errors that may still exist in the plan.

Approach 2: Publication with implementation after a period of time (e.g., six months)

The nesting plan is published in its finalized form but not implemented for a period of time.

- ✓ Allows projects and subnational jurisdictions to plan and prepare for implementation.
- ✗ Delays will introduce ever-greater disparities that will be hard to later bring together.

Approach 3: Piloting with subsequent full roll out

The nesting plan will be immediately implemented in a specified area operating as a pilot, with subsequent full roll out following later.

- ✓ Allows the plan to be tested and any kinks, incongruities and errors to be identified and corrected.
- ✗ Delays in full implementation will introduce ever-greater disparities that will be hard to later bring together.

4.3 Implementation challenges

The final challenge is fully implementing the integrated accounting program, and adapting it as needed through:

- incorporating lessons learned from early experience,

- incorporating improved data or methods,
- responding to the evolution of REDD+ initiative or other funding source requirement as they evolve, and any additional guidance from the UNFCCC, and
- adjusting to meet national or subnational legislation or policy decisions that emerge.

Key challenges when designing an integrated carbon accounting framework using the four-step process detailed above include:

Challenge 1: Understand the complexity, and then drive towards simplicity. The plethora of carbon accounting methodologies and standards are complex. When they interact, these complexities multiply. Through the assessment recommended in step 1, a deep understanding of the accounting methods being used in a country should be gained. This can be used in later steps to design a system that--while maintaining robustness--drives towards simplicity.

Challenge 2: Design carbon accounting systems to support the activities and incentive systems being developed for REDD+. There are an infinite ways to design a nested accounting system, the details of which may be beyond the understanding of many actors. What is important is that a participatory approach be used to set the objectives of the system, to make everyone aware of the tradeoffs across benefits that may be necessary (i.e., more of this attribute, but less of that one), and of the impacts on existing and future subnational and project REDD+ activities.

Challenge 3: Decide the direction in which data from monitoring systems and regarding reference levels will flow. We identify three broad options:

- a subnational/project-led approach, where data from lower levels is compiled to form a national dataset,
- a flexible national approach, where there is a national forest monitoring system and reference level which integrates program and project level data,
- a strong national approach where there is a national forest monitoring system and reference level which does not integrate program and project level data, and lower level REDD+ activities are required to use nationally derived data.

Challenge 4: Integrate National Forest Monitoring Systems and Reference Levels by requiring compliance with certain technical standards or by specifying particular technical requirements. The latter takes more effort to develop and implement but leads to greater harmonization.

Challenge 5: Design fair and transparent approaches for handling overlapping programs or projects that maintain the environmental integrity of the emissions reductions claimed. These include:

- deduct emission reductions earned by lower-level programs from national total, or
- cap the emission reductions that lower-level programs can claim, or
- exclude areas covered by subnational programs or projects from national accounting, or

- d. incorporate lower-level data temporarily.

These approaches could be combined, and could be phased in following a grace period.

Challenge 6: Clear and simple rules and procedures for integrating the carbon accounting of REDD+ programs and projects into the national approach need to be developed quickly. This can occur through trial and error by early actors in countries, and via accelerated methods development and vetting by international experts and consensus building processes, like the existing REDD+ initiatives and knowledge exchanges.

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