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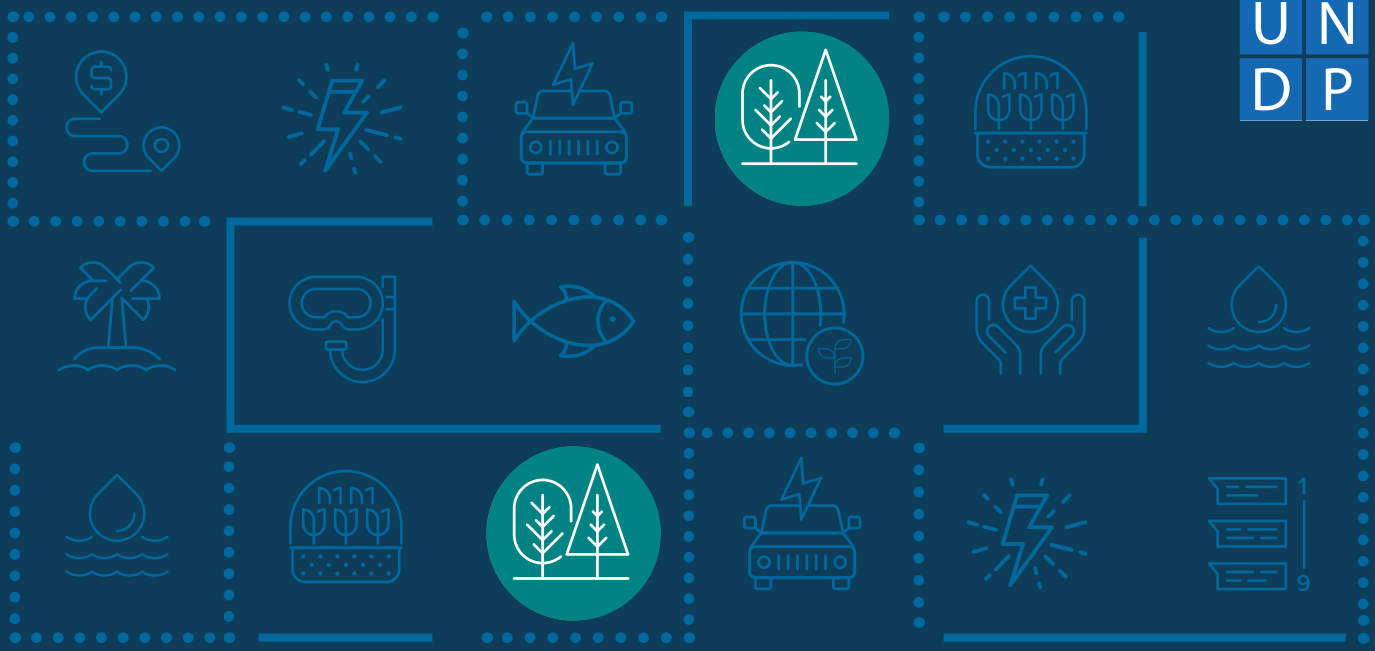

GUIDEBOOK

on the methodology for financial assessments to address climate change

CHAPTER VII: FOREST SECTOR

(adaptation to climate change)

2026

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About this publication

This methodology is an update to the first financial assessment methodology, which was released in 2009. The objective of this methodology is to support countries to implement their climate targets and to identify, reallocate, mobilize and manage the required financial resources and to create a fiscal framework conducive for climate action.

The update to this methodology was developed under UNDP's Climate Promise by the *Pledge to Impact* Programme. Delivered in collaboration with a wide variety of partners, the initiative has supported over 120 countries to enhance and implement Nationally Determined Contributions (NDCs) under the Paris Agreement. From Pledge to Impact is generously supported by the governments of Germany, Japan, United Kingdom, Sweden, Belgium, Spain, Iceland, the Netherlands, Portugal and other UNDP core contributors. This programme underpins UNDP's contribution to the NDC Partnership.

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About this Guidebook

As countries identify their national climate change targets—notably through Nationally Determined Contributions (NDCs) under the Paris Agreement—the need exists to break down targets into concrete steps of action, determine a financial framework to implement actions and achieve targets, and identify policy measures to facilitate the necessary changes that support low-emission development and a low-carbon future.

A key component to support this transformation is through assessing national investment flows and financial flows to address climate change. Many countries have used this method to articulate an effective and appropriate national response to climate change.

This Guidebook responds to the needs of countries to have a clear approach to support the implementation of national climate targets in the context of sustainable development that duly accounts for their national circumstances, capacities and resources.

Between 2008 and 2024, 60 investment flow and financial flow assessments were conducted worldwide, with more than 1,000 national stakeholders engaged in the technical and political aspects of the assessments. Since the adoption of the Paris Agreement and the development of NDCs, the methodology has helped countries utilize financial assessments to develop a pathway to NDC implementation.

While this methodology was first developed in 2008, an update has taken place in 2025. This Guidebook is a living document, which will continue to be improved based upon the experiences of those using it. Over the years, the methodology to carry out financial assessments to address climate change has been continually reviewed and updated regarding its user friendliness, feasibility of implementation and sectoral scope. Comments are invited. Please send feedback to Susanne Olbrisch (susanne.olbrisch@undp.org).

For more information, visit https://climatepromise.undp.org/tags/investment-and-financial-flows-assessments.

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List of acronyms and abbreviations

A/R	Afforestation/reforestation
AFOLU	Agriculture, Forestry and Other Land Uses
BAU	Business-as-usual
BS	Baseline scenario
CATIE	Centro Agronómico Tropical de Investigación y Enseñanza
CIFOR	Center for International Forestry Research
CO_2	Carbon dioxide
FF	Financial Flow
GCF	Green Climate Fund
GEF	Global Environment Facility
GHG	Greenhouse gas
IF	Investment Flow
IPCC	Intergovernmental Panel on Climate Change
LT-LEDS	Long-term Low-Emission Development Strategy
LULUCF	Land Use, Land-Use Change and Forestry
NAP	National Adaptation Plan
NDC	Nationally Determined Contribution
NGO	Non-governmental organization
O&M	Operation and maintenance
ODA	Official Development Assistance
OECD	Organisation for Economic Co-operation and Development
REDD	Reducing Emissions from Deforestation and Forest Degradation in Developing Countries
REDD+	REDD plus the role of conservation, sustainable management of forests and enhancement of forest carbon stocks
UN FAO	United Nations Food and Agriculture Organization
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
V&A	Vulnerability and adaptation

Chapters I and II of this guide provide methodology on how to carry out a financial assessment. This chapter provides additional information needed to carry out a financial assessment for **adaptation in the forest sector**. To avoid repetition, some of the information provided in Chapter II that is relevant to all sectors is not included in this chapter. Careful reading of Chapter II before this chapter is highly recommended.

7.1 Introduction

The impacts of climate change are likely to affect all forest landscapes. Indeed, predicted changes in climate variables will place severe pressure on the ability of forest landscapes to adapt and survive. With rising temperatures, changes in water availability and the expected doubling of carbon dioxide levels, it is anticipated that forests will change in two main ways: 1) structure (physiology and metabolism); and 2) ecosystem functioning (Table 7.1 breaks down the potential changes further). These changes will impact the availability and quality of forest goods and services. The carbon sink of mature forests may be threatened by fire, pests, drought and heat waves, affecting forestry production, including timber.

Table 7.1: Summary of climate change impacts on forest ecosystems

Climate factor	Cell level	Organism level	Species level	Ecosystem level
CO_2 increase	Photosynthetic rate increase Stomatal conductance reduction	Growth rate increase Water use efficiency increase Seed production increase	Decreased seed mortality Increased recruitment Period for individuals to reach maturity Changes in individual population density	Biomass production increase Alterations in species competitiveness Changes in species composition
Temperature increase	Photosynthesis increase or decrease Photosynthetic period can increase Transpiration increase	Primary production positive or negative changes Seed production changes	Regeneration rate changes Possible increase in tree mortality Negative consequences for species sensitive to temperature changes	Alterations in species competitiveness Species composition changes Soil mineralization increase
Rainfall regime changes	Growth rate reduction due to lower rainfall	Increase in seed mortality rate due to lower rainfall	Increase mature individuals' mortality rate	Alterations in species competitiveness Species composition changes

Source: Meer, Kramek and Wjik (2001) adapted by Robledo, C. and C. Forner (2005). "Adaptation of forest ecosystems and the forest sector to climate change." Forest and Climate Change Working Paper 2, FAO, Rome.

The potential impacts of these changes on trade of forest goods and services include:

- decrease in timber production as a result of increased extreme events, such as forest fires, hurricanes, flooding and droughts;
- decrease in timber production due to changes in ecosystems and increased pests;
- changes in the quality of timber and non-timber forest products;
- changes in the regional distribution of timber species;
- impacts on the ability of species designed for productive plantations to maintain growth rate and wood quality over the next 30 to 50 years;
- indirect impacts on the timber chain due to changes in quantity and quality of offered timber;
- impacts on the availability and quality of forest ecosystem services;
- impacts on forest-dependant livelihoods (including reduction in food and shelter);
- changes in land use patterns due to an increasing demand for agricultural land;
- impacts on other sectors, especially agriculture, energy and water; and
- disaster risks due to reduced functions of the forest (e.g., landslides due to degradation).

Given that the objective of adaptation is to reduce the vulnerability of social and natural systems, many potential actions can be taken. Adaptation options can generally be divided into two categories: management options and policy options (see Table 7.2).

Table 7.2: Management and policy adaptation options

Forest management options	
Maintain and provide ecosystem services	Maintain the extent of forests
	Facilitate natural adaptation of biological diversity
	Maintain forest health
Maintain and provide provisioning services	Maintain the productivity of forest ecosystems
	Maintain the tangible socio-economic benefits
Maintain and provide regulating services	Maintain soil and water resources
	Maintain and enhance forestry's contribution to global carbon cycles
	Regulate human diseases and reducing disasters
Maintain and provide cultural services	Maintain cultural values and local knowledge
	Maintain aesthetic services (scenic beauty)
	Maintain spiritual services
	Maintain educational services
	Maintain recreational services
Forest policy options	
	Include adaptation issues in international forest policymaking and its related programmes
	Include adaptation in the forest sector in multilateral environmental funds (e.g., GEF, climate change funds)
	Include vulnerability and adaptation issues in national forestry plans
	Include vulnerability and adaptation issues in decentralization in the forest sector
	Promote clarification of tenure, use and access rights of forest ecosystem services related to vulnerability and adaptation
	Promote inter-sectoral dialogue and dialogue among forest stakeholders

Source: Seppälä *et al.* (eds.) (2009). A global assessment on adaptation of forests to climate change.; and author compilations.

7.2 Application of the financial assessment methodology to adaptation in the forestry sector

This section describes how the financial assessment methodology in Chapter II can be applied to adaptation in the forestry sector.

As described in Chapter II, the financial assessment involves a series of steps, which are:

Step 1. Establish key parameters of the assessment.

Step 2. Compile historical IF, FF and O&M cost data (and subsidy cost data if included explicitly) and other input data for scenarios.

Step 3. Define baseline scenario.

Step 4. Identify annual IF, FF and O&M costs (and subsidy costs if included explicitly) for the baseline scenario.

Step 5. Define target scenario.

Step 6. Identify annual IF, FF and O&M costs (and subsidy costs if included explicitly). for the target scenario

Step 7. Calculate the changes in IF, FF and O&M costs (and in subsidy costs if included explicitly) needed to implement target scenario.

Step 8. Identify policy implications.

Step 1.

Establish key parameters of the assessment.

Define detailed scope of the sector.

The question here is which forest ecosystems are relevant for adapting to climate change in a given country. 'Adapting' includes the consideration of forest ecosystems and other ecosystems that rely on ecosystem services as well as the consideration of forest dependent people. It is important to clarify the issues below.

a. The vulnerability of forest ecosystems to climate change: Which forest ecosystems are vulnerable to which climate variables? How vulnerable are these?

b. Which are the ongoing coping strategies from forest ecosystems and forest-depending people to changes in climate?

c. How do healthy forest ecosystems contribute to adapting to climate change? Would they increase resilience in other sectors?

The first step for clarifying the questions above is to define the subsectors that should be part of the assessment, based on the national target that is being assessed (NDC, LT-LEDS or others). It will be necessary to identify the subsectors and also which forest ecosystems should be included in the assessment (filling in Table 7.3 will help with this task).

Table 7.3: Chart to use for identification of forestry subsectors and ecosystems

Subsectors	Primary forest		Secondary or degraded forest		Plantations		Other forest lands (e.g., mangrove, bushland, etc.)
	Managed	Unmanaged	Managed	Unmanaged	Managed	Unmanaged	
Vulnerable forest ecosystems							
Forest ecosystems relevant for reducing vulnerability of forest-depending people							
Forest ecosystems relevant for reducing vulnerability of other sectors or land uses (e.g., water sector or agricultural land)							

As far as possible it is recommended that the national team includes the name or geographical location of the specific ecosystem, when completing Table 7.3. The more accurate the table is, the more accurate the financial assessment for adaptation in the forest sector will be.

Once the forest ecosystems to be included in the assessment have been identified, the key stakeholders related to the use and management of these forest ecosystems and the sources of investment will be identified. Be aware that many activities related to adaptation and forest ecosystems are not quantified in monetary terms (e.g., gathering food during drought periods), neither in terms of investment nor financial flows.

At the end of this step, the national team will have a list of subsectors and forests stakeholders relevant for adapting to climate change (which can be put into Table 7.4).

Table 7.4: Ecosystems and stakeholders relevant for adapting forests to climate change

Name and location of ecosystem	**Type of ecosystem** (primary forest, secondary/ degraded forest, plantation, other forest land)	**Role in adaptation change** (vulnerable forest ecosystem, forest ecosystems relevant for reducing vulnerability of forest-dependent people, forest ecosystems relevant for reducing vulnerability of other sectors or land uses)	**Stakeholders involved** (indigenous peoples, local communities, local or national governments, management companies)

Specify base year and assessment period.

The base year should be the latest year in which historical information is available, e.g. 2025. The assessment period should match the time horizon of the national target that is being assessed. Often NDCs have a time horizon of 2030, LT-LEDS often have a time horizon of 2050.

Identify the target to be assessed and adaptation measures.

The adaptation measures to be included will be based on the national target that is being assessed. Often national targets are broad and visionary in nature, so for the assessment the targets will need to be broken down into concrete measures and steps, for which IF and FF can be identified. The information gathered in the tables above can help doing this. Examples of forest management options are provided below in Table 7.5.

Table 7.5: Examples of forest management options

Forest management options
Sustainable forest management, including conservation (REDD+)
Forest restoration
Plantations (afforestation/reforestation)
Plantations for substitution through harvested wood products
Plantations for substitution through non-wood products (bioenergy)

Source: Elaboration by the authors.

Select analytical approach.

Analytical options for a financial assessment in the forestry sector include using a sectoral model, plan or projections. Approaches can range from simple spreadsheets to dynamic forest management models.

A useful starting point for the assessment can be a sectoral plan (e.g., a national forest programme, a forest master plan) which typically describes the current situation and applies projections of trends in forest area by type, production and consumption of forest products, etc. Useful sources include national climate change reports (national strategy studies, National Communications, National Adaptation Plans) and national plans in the forest sector (national forest programmes and forest investment plans that are often associated with them). In some cases, data may considerably differ among sources (in which case it is useful to refer to the FAO database).

Table 7.6: Dynamic analytical models for the forest sector

Name	Developer(s)	Description
Dynamic global vegetation models	Various	A class of computer programmes that simulate shifts in potential vegetation and its associated biogeochemical and hydrological cycles as a response to shifts in climate. These models use time series of climate data and, given constraints of latitude, topography and soil characteristics, simulate monthly or daily dynamics of ecosystem processes. These models are used most often to simulate the effects of future climate change on natural vegetation and its carbon and water cycles.
FAO forest plantation profitability model	FAO	The long rotation forest plantation model generates account price sized curves and yield models. Data can be adapted for any country.
CRiSTAL	IISD, Intercooperation, IUCN, SEI-B	The Community-based Risk Screening Tool – Adaptation and Livelihoods (CRiSTAL) is designed to help project planners and managers to integrate climate change adaptation into community-level projects.
ITFMP forest concession and forest industry models	FAO	These models analyse forest concessions and cash flows for incomes and expenditures. Data can be easily input for any country.

As forest adaptation options are related to the maintenance and enhancement of ecosystem services, these usually provide considerable socio-economic and environmental co-benefits that further increase the resilience to climate change. Measures in the forest sector may increase the resilience of other sectors. For example, when forests reduce the risk of avalanches, the resilience of the downstream systems (agricultural land or settlements) may increase. These externalities should be considered and captured in the assessment.

Step 2.

Compile historical IF, FF, O&M cost data (and subsidy cost data if included explicitly), and other input data for scenarios.

Compile historical annual IF and FF data, disaggregated by investment entity and source.

Historical investment and financial flows data are needed as a basis to develop future scenarios. The historical data give an understanding of past investment patterns and a context for public and private plans for the sector, which can be used when developing the scenarios with the associated IF and FF. The methodology recommends that countries compile 10 years of historical investment and financial flows data (i.e., for the base year and the previous nine years). At a minimum, countries should collect at least three years of data (i.e., for the base year and two years during the previous decade). Data should be compiled for each investment type, be annual and be disaggregated by investment entity and by funding source. Data should also be divided into investment flows and financial flows (see Chapter II, Table 2.3: 'Template for one year of historical investment and financial flows data').

In the forest management sector, investment flows include assets, such as land, vegetal material, equipment for reduced impact logging, equipment for research and institutional equipment (e.g., computers, hydro-meteorological gages, vehicles). Financial flows include non-asset investments in research, education, assistance and institutional matters (e.g., labour costs).

The investment and financial flows data will reside in different locations (e.g., national accounts, ministry records and plans, industry records, statistical agencies, extension agencies, research institutions, etc.). Note that sectoral and subsectoral definitions and disaggregation will vary among data sources, so decisions may need to be made to reconcile datasets and extract data. The following table shows a compilation of historical data to develop a baseline scenario in the forestry sector (Table 7.7).

Table 7.7: Compilation of historical data to develop a baseline scenario in the forestry sector, example of the measures 'sustainable forest management' and 'forest restoration'

	Historical IF, FF & O&M (million 2025 US$)					
Category of investment entity	**Investment Type 1: Sustainable forest management system**			**Investment Type 2: Forest law compliance and monitoring**		
	IF	**FF**	**O&M costs**	**IF**	**FF**	**O&M costs**
Households						
Corporations						
Government						
Total						

Compile historical O&M data, disaggregated by investment entity and source.

Historical O&M data are needed to extrapolate information for the scenarios. Annual O&M costs should be collected for assets purchased during the historical period and for assets purchased prior to the historical period but that are still in operation. O&M data will be collected per forest adaptation option and disaggregated by year and by investment entity and source.

The O&M data may reside in similar locations as investment and financial flows data (e.g., national accounts, ministry records and plans, industry records, statistical agencies, extension agencies, research institutions). If such data are not available, countries should utilize one of the estimation approaches described in Chapter II.

Compile historical annual subsidy cost data, if subsidies are included explicitly in the assessment.

The explicit inclusion of subsidies in the financial assessment is optional because filtering out subsidies from other types of finance may not always be possible. However, if a country chooses to include subsidies explicitly, they should be included for investment and financial flows in the historical data set.

In some countries national programmes on subsidies for facilitating investments in the forest sector are available. If that is the situation in the country, the subsidies should be differentiated in the assessment.

Compile other input data for scenarios.

In addition to historical investment and financial flows data, the characterization of the scenarios requires other historical data relevant to the sector and socio-economic information. Such information is generally available through governmental agencies, such as ministries or forest departments, forest research centres, ministries of territorial planning, agriculture and environment, national statistics office and governmental agencies dealing with development-related statistics. Especially relevant is the amount of ODA (multi- and bilateral) invested in the sector.

National information may be complemented with international databases, such as the FAO forest economics and policy division databanks that provide information on forest finance, including investments in forest management and trade of forest products.

Research institutions also provide useful information, such as the Center for International Forestry Research (CIFOR) and *Centro Agronómico Tropical de Investigación y Enseñanza* (CATIE).

Step 3.

Define baseline scenario.

This step entails characterizing the forestry sector over the assessment period (e.g., 2025 – 2050) assuming business-as-usual conditions, i.e. based on the historical data it extrapolates and given current sectoral plans, what will occur in the sector in the absence of new and scaled up policies to adapt to climate change. The baseline scenario should be consistent with trends reflected in the historical data collected, unless sectoral or broader national plans dictate otherwise.

Table 7.8: Possible subsectors for the baseline scenario development

Name of the forest ecosystems	Current management	Historical trend	Baseline scenario
Natural parks	Sustainable (production forest/protected area) management	Secured protected area or sustained yield management	To be determined according to the existing forest policy and other policies which regulate land use
Conservation areas	Unsustainable forest management in production and multi-use forests	Illegal use for logging and firewood gathering	
Other natural forest	Unsustainable forest management (continuously threatened by deforestation and/or under degradation)	Continuation of increase in degradation Tendency to land use	
Plantations	Extensively used	Production plantations	
Forest or non-forest	Forest plantations, grassing land, cropland, waste/ abandoned land	Maintaining current use at the same productivity	

The major difficulty in quantifying the investments and financial flows for the baseline is the uncertainty of impacts due to future climate change. If changes in climate are expected the potential losses should be considered.

Step 4.

Identify annual IF, FF and O&M costs (and subsidy costs if included explicitly) for the baseline scenario.

Identify annual IF and FF for each investment type, disaggregated by investment entity and funding source.

In this step, annual IF and FF for the baseline scenario are identified. Costs should be in real terms (i.e., inflation adjusted) in constant 2025 US$ or national currency, should be reported in the year in which they are expected to be incurred and should be discounted using both appropriate public and private discount rates. The annual IF and FF values for each investment type should be disaggregated by investment entity and funding source.

The output of this step will be a stream of annual investment flows and financial flows for each investment type for the entire assessment period, by investment entity and funding source. These data should be organized as outlined in Chapter II, Table 2.6: 'Baseline scenario: *cumulative* investment and financial flows and O&M' and Table 2.7: 'Baseline scenario: *annual* investment and financial flows and O&M.'

For each activity of the baseline scenario the investment will be identified by source. Below are examples of categories of sources.

- Domestic public financing, including investments by national and local governments through transfer payments, soft loans, non-monetary incentives through, for example, preferential resource policies, payments for forest-based services, such as freshwater conservation and direct investment.

- International public funding through bilateral Official Development Assistance (ODA) grants, multilateral ODA (including grants, investment lending, investment guarantees); multilateral targeted programmes, such as the Forest Carbon Partnership Facility, UN-REDD, GEF, CDM and voluntary carbon markets, etc.

- Private investment funding including foreign direct investment by forest industries (for example the Forestry Development Center in the Philippines), investments by financial institutions and institutional investors, philanthropic funding and targeted funding through international conservation funds.

Identify annual O&M costs for each investment flow, disaggregated by investment entity and funding source.

Annual O&M costs for the baseline scenario are needed, including O&M costs for assets purchased during the assessment period and O&M costs for assets purchased before the assessment period that will still be in operation.

The output of this step will be a stream of annual O&M costs for each investment type that includes a new asset purchased during the assessment period and streams of annual O&M costs for assets purchased prior to the assessment period, disaggregated by investment entity and funding source.

As with investment and financial flows data, O&M costs may be from the output from a sectoral model, might be obtained from planning documents or might be derived from the historical data. Information may be available from the investment entities and relevant government ministries, statistical agencies or research institutions.

Identify annual subsidy costs for each investment type and for IF, FF and O&M costs, if subsidies are included explicitly in the assessment.

If a country chooses to include subsidies explicitly in their assessment, annual subsidies for the baseline scenario are required. Subsidies should be identified for each relevant investment type, and for IF and FF, as in Chapter II, Table 2.5: 'Template for three years of historical subsidy cost data.' Costs should be in real terms (i.e., inflation adjusted), in constant 2025 US$ or national currency, should be reported in the year in which they are expected to be incurred and should be discounted using appropriate public and private discount rates.

In some countries national programmes on subsidies for facilitating investments in the forest sector are available. If that is the case, the subsidies should be differentiated in the assessment.

Step 5.

Define target scenario.

This step entails developing a description of what is likely to occur in the forest sector, over the assessment period, in the presence of new and scaled up policies to adapt to climate change, based on the national target that is being assessed (NDC, LT-LEDS, other). The forest target scenario should describe expected socioeconomic trends, technological change, relevant sectoral and national plans and the adaptation measures that will be implemented (including the nature, scale and timing of each).

Several forest adaptation sector options, and their associated investment and financial flows, can be similar to those options for mitigation in the forestry sector, so double counting when looking at mitigation versus adaptation options should be avoided. Of course, forestry options that support both mitigation and adaptation offer synergies that can increase the cost-efficiency.

If a model is being used in the analysis, it can be used to develop and define the target scenario. Otherwise, a sectoral plan or a projection of trends can be used as the basis of the projection. Prior work on climate change (e.g., National Communications, technology needs assessments, National Adaptation Plans, National Adaptation Plans, GHG mitigation assessments, vulnerability assessments, etc.) should be utilized in this step.

Many potential activities exist for a forest adaptation programme (see Table 7.9).

Table 7.9: Potential activities for forest adaptation

Activity needed to achieve targets	Focus might include
Implementation of strategies for more effective conservation and management of forest protected areas	› Review of the national conservation plan › Completion of gazettal › Investment in training and professional capacity › Development of effective management of protected areas › Development of collaborative management arrangements and ecosystem restoration › Implementation of demonstration projects (plantations, conservation projects, etc.)
Implementation of strategies for more effective management of production forests	› Forest and law enforcement and governance programme-related initiatives to contain illegal logging › Voluntary codes by private sector companies › Outcome-based third-party certification › Investment in reduced impact logging
Strategies for forest restoration	› Decentralization of forest management › Silviculture (natural regeneration, enrichment planting) › Ecological restoration › Investment in reduced impact logging

Table 7.9: Potential activities for forest adaptation *(continued)*

Activity needed to achieve targets	Focus might include
Revised strategies for increasing plantation systems with an adaptation potential (e.g., upstream watershed protection and combating soil degradation plantation with natural species)	› Inventory of all useable land › Research climate resilient species › Planted forests (timber and non-timber forest products) › Watershed/desertification regreening › Improving investment conditions for specific plantation systems
Enhancement of the capacity of community groups, including communities to take control of forest management	› The main objectives would be to improve quality of life for low-income families living in or adjacent to natural forests, to protect the rights of forest-dependent indigenous peoples, reduce encroachment and forest degradation by subsistence activities and reducing forest fire

Step 6.

Identify annual IF, FF, O&M costs (and subsidy costs if included) for the target scenario.

In this step, annual IF and FF for the forest target scenario activities are identified. The methodological steps are outlined in Chapter II, Step 6. Investment figures that are attributed in this step represent scales of magnitude and need to be based on professional experience and consensus.

The result of this step will be a stream of annual and cumulative IF, FF and O&M costs (as shown in Chapter II, Table 2.8: 'Target scenario: *cumulative* investment and financial flows and O&M' and Table 2.9: 'Target scenario: *annual* investment and financial flows and O&M').

Step 7.

Calculate the changes in IF, FF and O&M costs (and in subsidy costs if included explicitly) needed to implement target scenario.

In this step, the necessary shifts and increases in IF, FF and O&M costs needed to implement the target scenario in the forest sector are calculated. This is done according to the general methodology as outlined in Chapter II, Step 7. The shifts and increases in investments and financial flows are obtained by subtracting the baseline scenario values from those of the target scenario. The two objectives of this step are to determine: 1) how *cumulative* IF, FF and O&M costs would change; and 2) how *annual* IF, FF, and O&M costs would change. If subsidy costs are included explicitly in the assessment, the changes in subsidy costs will be calculated. The accompanying Chapter XVI on reporting (Reporting Guidelines for the Assessment of Investment and Financial Flows to Address Climate Change) and excel sheets contain worksheets for capturing all scenario information and for performing these calculations.

Step 8.

Identify policy implications.

Having determined the necessary shifts and increases in the previous steps, the purpose of this step is to identify the policy implications to incentivize the necessary changes.

Looking at the results of Step 7, the investment entities responsible for the most significant shifts and increases in investment and financial flows need to be identified and the predominant sources of their funds. Then policies need to be identified to induce those entities to implement the proposed measures and change their investment patterns and mobilize the additional investment and financial flows to implement the target scenario. It will be important to distinguish between public and private sources of finance and between domestic and foreign sources. Policy measures include a variety of instruments, including regulations, incentives and education. New sources of funds include both domestic options, such as taxes, and foreign options, such as ODA, carbon funds and markets for environmental services.

Key challenges in the forestry sector include issues around forest land tenure, negative impacts of unregulated activities in the forest sector and difficulties in curtailing the influence of commercial pressure on forests.

Policies will be needed to induce the relevant entities to implement the proposed measures and incur the related investment and financial flows. A key factor will be convening all relevant stakeholders in the forestry sector, including government entities (forestry, agriculture, environment, water), private sector, environmental and social NGOs and those communities impacted by the regulations or incentives necessary to influence investment decisions.

When addressing the policy options, social, economic and environmental benefits should be assessed qualitatively. The forestry sector is very particular, as forest-based adaptation options have the potential of co-benefits, including mitigation of climate change. Thus, the entire benefit package will go beyond the estimated costs of mitigation in the forest sector.

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