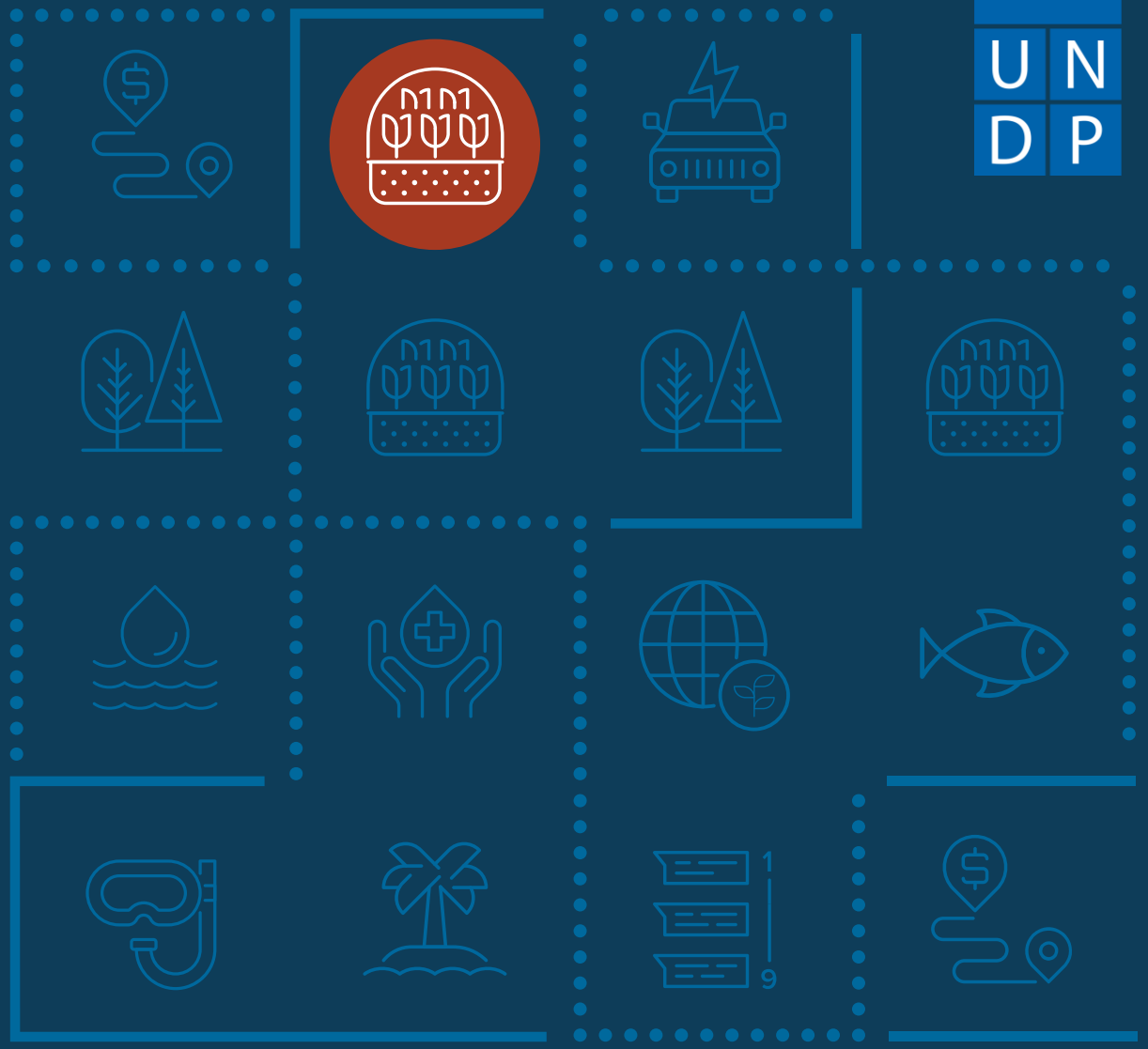
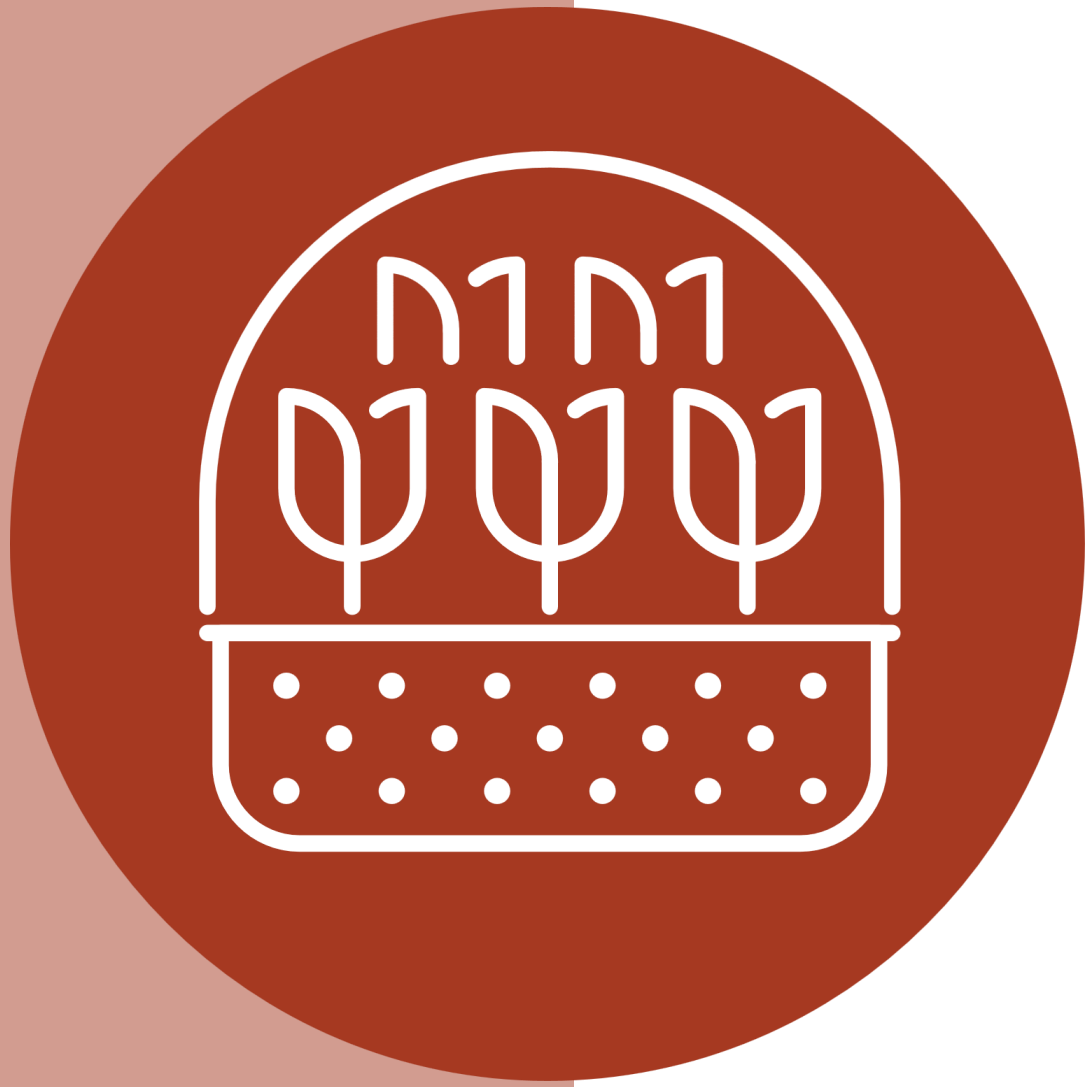
UNITED NATIONS DEVELOPMENT PROGRAMME

GUIDEBOOK

on the methodology for financial assessments to address climate change

FINANCIAL ASSESSMENT TO ADDRESS CLIMATE CHANGE IN THE AGRICULTURE SECTOR (Mitigation)





Relevance of the agriculture sector

- Agricultural production is heavily dependent on climate and water resources, and consequently is quite sensitive to changes in climate.
- Moreover, most rural populations in developing countries rely primarily upon agriculture for their livelihoods.
- Dependence of national agriculture on rain, strategy: more crop per drop.
- Total global net anthropogenic GHG emissions from AFOLU were around 21% of total global net anthropogenic GHG emissions over the period 2010-2019 (IPCC, 2023).

Step 1. Establish key parameters of 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.

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Step 8. Identify policy implications.

Step 9. Synthesize results and complete the report.

Step 1.

Establish key parameters of the assessment.

- Define scope and boundaries for the assessment
- Define the institutional framework
- Specify the time horizon for the assessment, matching the time horizon of national target being assessed
- Specify base year (latest year with data available)
- Build on existing model/analysis/tracking system as applicable

Define boundaries for the assessment

Scoping the agriculture sector

- Can include:
  - Production or processing of agricultural products
  - Food crops, floral crops, nursery plants, biofuel crops non-food crops …
  - Livestock: Certain species, certain diseases, lifestock fodder …
  - Diary production or processing

Define boundaries for the assessment

Divisions	Groups	Classes
Crop & animal production, hunting & related service activities	Growing of non-perennial crops	Cereals, leguminous crops & oil seeds, vegetables, roots, tubers, …
	Growing of perennial crops	Tropical & subtropical fruits, pome fruits & stone fruits, other tree & bush fruits & nuts, …
	Plant propagation	Plant propagation
	Animal production	Cattle & buffaloes, horses & other equines, camels & camelids, sheep & goats, swine & pigs, …
	Mixed farming	Mixed farming (crops & animals)
	Support activities to agriculture & post-harvest crop activities	Support activities for crop production, animal production, …
	Hunting, trapping & related service activities	Hunting, trapping & related service activities

Select analytical approach

- Development of simple speadsheets based on Excel sheets provided by this financial assessment methodology
- Building on existing transport models, tracking system, budget tagging as applicable
- Use sector projections/trends to determine projected demand and supply in the sector

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Step 2.

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

- Gather disaggregated IF and FF data on investment types (e.g. wind energy facilities, biomass fired power plant, etc.), investment entities and funding sources for 3-10 years in the recent past
- Gather socio-economic information (demographic development, economic development etc.) for 3-10 years in the recent past

Data sources

Sources of data:

- Sectoral plans
- Development plans
- Energy sector/econometric models
- National budget tagging/tracking or transparency mechanisms
- Private sector reports
- GHG Inventories, National Communications etc.
- System of National Accounts (SNA), Systems of integrated environmental & economic accounts (SEEA)

Data sources

Data source complementing national sources:

- AQUASTAT: Data & information on water resources & agricultural water management by country & region. Includes data on dams, irrigation system investment costs, & irrigated areas: http://www.fao.org/nr/water/aquastat/main/ index.stm

Data sources

Type of flow	Type of physical asset
Investment flows	Agricultural & livestock development
	Agricultural land resources & water resources, pastures
	Agricultural inputs
	Food crop & cash crop production
	Livestock
	Agricultural alternative development
Financial flows	Agricultural extension & reform, grassland management
	Policy & planning
	Education/training
	Agricultural & livestock research & services
	Plant/post-harvest protection & pest control
	Agricultural & livestock financial services
	Agricultural co-operatives
	Livestock/veterinary services

Data collection

Examples of IF and FF data disaggregation in each subsector

Category of investment entity	Source of IF and FF	Investment Type 1 (IF, FF, Total)	Investment Type 2 (IF, FF, Total)	Investment Type 3 (IF, FF, Total)	Total investment
Households	Domestic				
Corporations	Domestic				
	Foreign				
	Total Corporation Funds				
Government	Domestic				
	Foreign				
	Total Government Funds				

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Define a baseline scenario.

- Define the physical basis for the baseline scenario
- **Baseline scenario:** description of what is likely to occur in the absence of ADDITIONAL policies to address climate change; expected socio-economic trends (e.g., population growth and migration, economic growth), technological change and expected business-as-usual investments in the sector.

Define baseline scenario

- Characterizing each relevant electricity supply and electricity end-use subsector over the assessment period
  - Assuming no new climate change policies are implemented
- Baseline scenario reflects:
  - Current sectoral and national plans
  - Expected socio-economic trends
  - Expected investments in the subsectors

Define physical basis for the baseline scenario

- Information should be disaggregated by:
  - Year (starting 10 years before the assessment's Base Year)
  - Source (by corporations & government)
  - Type (national funds, foreign direct investment, official development assistance

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Step 4.

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

- Compile annual data, disaggregated by investment entity, funding source, investment flow type, financial flow type
- Calculate the **total IF and FF** in real, unannualized terms over the planning period
- Define **annual IF and FF** of the baseline scenario

Define and project annual IF and FF

Funding entity category	Source of funds	Cumulative IF and FF* 2025-2050 (billion 2025 $)	
		IF	FF
Households	Domestic		
Corporations	Domestic equity		
	Foreign investment		
	Domestic debt		
	Foreign borrowing		
	Government support		
	Foreign aid (ODA)		
Government	Domestic funds (budgetary)		
	Foreign borrowing (loans)		
	Foreign aid (ODA)		
	Total		

* Drought-resistant seeds (2025 $/unit), machinery (2025 $/piece), fertilizers(2025 $/kg), irrigation channels (2025 $/meter), …

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Define the target scenario.

- **Target scenario:** incorporates new and scaled-up measures to address climate change
- The target scenario should describe expected socio-economic trends, technological change, relevant measures to reduce GHG emissions and the expected investments in the energy sector (e.g. end-use and supply subsectors) to implement those mitigation measures

Agriculture sector measures

Type of measure	Component of agriculture sector	Adaptation/Mitigation measure
Field-level	Crop Production (including production of human food crops, fodder, industrial crops, & biofuels)	Change crop species/varieties
		Moisture management/irrigation
		Pest & disease management
		Fire management
	Livestock (including both animal management & grazing land management)	Change animal species/breeds
		Change in animal management
		Change in pasture management
		Moisture management/irrigation
		Management of natural areas
Research, education, assistance, infrastructure, institutional	Sector-wide	Research, extension & training
		Forecasting & disaster management
		Trade policy

Two approaches to define target scenario

- Approach #1: assume an end point for electricity supply emissions:
  - E.g. Set a target in 2030 for emissions from the electricity sector
- Approach #2: assume a set of technologies for electricity supply:
  - E.g. Articulate a set of technological options to meet future energy demand

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Step 6.

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

- Compile annual data, disaggregated by investment entity, funding source, investment flow type, & financial flow type
- Calculate the **total IF and FF** in real, unannualized terms over the planning period.
- Define **annual IF and FF** of the target scenario

Derive IF and FF of target scenario

Facility/Technology	Cumulative infrastructure (2015-2030)	Unit cost
Drought-resistant seeds	(# units purchased)	(2025 $/unit)
Machinery	(# tractors etc.)	(2025 $/piece)
Fertilizer	(# kg purchased)	(2025 $/kg)
Irrigation channels	(# meters installed)	(2025 $/meter)
Total		

Define and project annual IF and FF

Funding entity category	Source of funds	Cumulative IF and FF 2025-2050 (billion 2025 $)	
		IF	FF
Households	Domestic		
Corporations	Domestic equity		
	Foreign investment		
	Domestic debt		
	Foreign borrowing		
	Government support		
	Foreign aid (ODA)		
Government	Domestic funds (budgetary)		
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Calculate the changes in IF, FF and O&M costs (and in subsidy costs if included explicitly) needed to implement target scenario.

- Subtract the annual IF and FF of the baseline scenario, by entity and funding source, from the annual IF and FF of the target scenario, by entity and funding source
- Sum incremental amounts over all years, by entity and funding source

Determine changes in IF and FF

IF and FF of target scenario

minus

IF and FF of baseline scenario

= Additional IF and FF

- For each mitigation option the assessment must identify the additional IF and FF by source (national funds, etc.) throughout the assessment period to implement the national target being assessed.

Calculate incremental IF and FF

Funding entity category	Source of funds	Investment (billion 2025 $)		
		Cumulative (2025-2050)		Incremental
		Baseline scenario	Target scenario	
Households	Equity & debt	Baseline value	Target value	Target minus Baseline value
Corporations	Domestic equity	…	…	…
	Foreign investment			
	Domestic debt			
	Foreign borrowing			
	Government support			
	Foreign aid (ODA)			
Government	Domestic funds (budgetary)			
	Foreign borrowing (loans)			
	Foreign aid (ODA)			
	Total	Sum (Baseline)	Sum (Target)	Sum (Target minus Baseline)

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Identify policy implications.

- Identify the entities responsible for the significant incremental changes in investment and financial flows
- Determine the predominant sources of their funds
- Determine policy instruments and incentives to induce the required changes in investment and financial flows

Examples of policy options

- Based on the results of the assessment identify which investment entities are responsible for the largest shifts and increases in investment and financial flows, as well as their funds
- Identify policies to induce the required change to implement the assessed national target

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Synthesize results and complete report.

- Reporting takes place throughout the assessment, does not start at the end of the assessment
- Capturing information and data, decisions and assumptions completely and transparently
- Ensuring credibility of the assessment and enabling follow-up on the assessment results
- The Reporting Guidelines contain key tables required. Excel spreadsheets are available to organize and calculate data.

Q&A
Clarifications

About UNDP

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UNDP's Climate Promise is the UN system's largest portfolio of support on climate action, working with more than 140 countries and territories and directly benefiting 37 million people. This portfolio implements over US$2.45 billion in grant financing and draws on UNDP's expertise in adaptation, mitigation, carbon markets, climate and forests, climate risk and security, and climate strategies and policy. Visit our website at climatepromise.undp.org and follow us at @UNDPplanet.

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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