Food and Agriculture Organization of the United Nations

# Understanding opportunities, barriers and risks for private sector engagement in climate action for agrifood systems

## SCALA private sector engagement guidance series

April 2025

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# Contents

# ABBREVIATIONS

| | |
|---|---|
| **AFOLU** | agriculture, forestry and other land use |
| **AVC** | agricultural value chain |
| **BCR** | benefit–cost ratio |
| **CAR** | Climate Action Review |
| **CBA** | cost–benefit analysis |
| **CDKN** | Climate and Development Knowledge Network |
| **CPI** | Climate Policy Initiative |
| **CRA** | climate resilient agriculture |
| **EBRD** | European Bank for Reconstruction and Development |
| **FAO** | Food and Agriculture Organization of the United Nations |
| **GCF** | Green Climate Fund |
| **GHG** | greenhouse gas |
| **IRR** | internal rate of return |
| **MSMEs** | micro, small and medium-sized enterprises |
| **M&E** | monitoring and evaluation |
| **MDBs** | multilateral development banks |
| **MoALD** | Ministry of Agriculture and Livestock Department (of Nepal) |
| **NAP** | National Adaptation Plan |
| **NAP-AG** | National Adaptation Plan – Agriculture |
| **NDC** | Nationally Determined Contribution |
| **NDC-P** | NDC Partnership |
| **NPV** | net present value |
| **PARM** | Platform for Agricultural Risk Management |
| **PPP** | public–private partnership |
| **PSE** | private sector engagement |

| | |
|---|---|
| **R&D** | research & development |
| **RoI** | return on investment |
| **SCALA** | Scaling up Climate Ambition on Land Use and Agriculture through NDCs and NAPs |
| **SDGs** | Sustainable Development Goals |
| **SLA** | systems-level assessment |
| **TCFD** | Task Force on Climate-Related Financial Disclosures |
| **UNDP** | United Nations Development Programme |
| **UNFCCC** | United Nations Framework Convention on Climate Change |
| **USD** | United States Dollar |
| **VRA** | variable rate application |
| **WEF** | World Economic Forum |

# Figures, tables and boxes

## Figures



## Tables



## Boxes

# Acknowledgments

This brief was developed under the **Scaling up Climate Ambition on Land Use and Agriculture through Nationally Determined Contributions (NDCs) and National Adaptation Plans (NAPs) (SCALA) programme**, co-led by the Food and Agriculture Organization of the United Nations (FAO) and the United Nations Development Programme (UNDP) with support from the German Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection (BMUV) through the International Climate Initiative.

The brief was authored by Charles Callaghan, Neha Rai, and Shovon Kibria with editorial oversight by Subhi Shama and Marie Raison and technical oversight by Julie Teng and Sibyl Nelson. It is part of a guidance series developed under SCALA to enable private sector engagement in climate action for agrifood systems.

# Introduction

Agrifood companies and relevant private sector actors (see Box 1) are key partners in advancing the global climate agenda. In addressing the challenge of increasing private sector participation, it is important to recognize that the problem goes beyond the mere availability of capital. It is equally important to identify investment and bankable projects that offer attractive risk-adjusted returns while promoting low-carbon and climate-resilient outcomes.

NDCs and NAPs serve as key frameworks for realizing the goals of the Paris Agreement, yet progress in implementing the NDCs remain insufficient (UNFCCC, 2023). According to FAO's analysis of NDCs submitted as of January 1, 2024, 70% of NDCs highlight the importance of private sector engagement in their implementation. Of these, 53% explicitly emphasize the private sector's role in achieving the agrifood system component of NDCs. However, only a small fraction (7%) mention active engagement, such as a defined role in an NDC investment plan or participation in an ongoing climate initiative (Crumpler et al., 2025).

There is, thus, a clear gap between strategic climate goals and the creation of actionable investment plans. To close this gap and move from planning to implementation, these priorities need to be transformed into tangible, investible projects capable of attracting private sector funding (FAO, 2023).

**Box 1. Who is the private sector?**

The term "private sector" refers to a diverse group of actors and activities operating at international, national and local levels that play different roles in the agrifood value chain and/or the investment chain. These include:

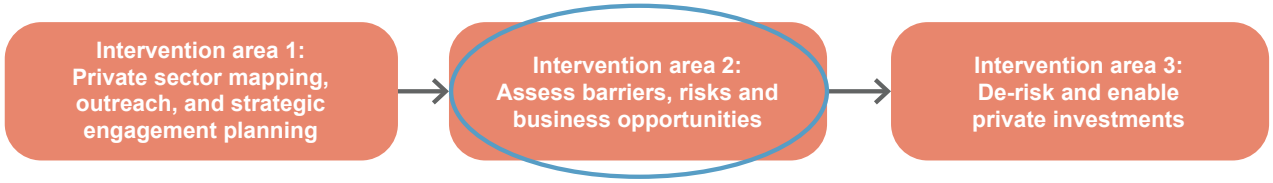
- Farmers and farmer's organizations
- Producer organizations and cooperatives
- Micro, small, and medium-sized enterprises (MSMEs)
- Enterprises (including multinational and state-owned)
- Industry, trade associations and private sector consortia
- Financial institutions
- Philanthropic foundations

This definition is based on FAO and UNDP's definitions of the private sector under their private sector engagement strategies. (FAO, 2021a; UNDP, 2023).

This brief has been designed under the **Scaling up Climate Ambition on Land Use and Agriculture through Nationally Determined Contributions (NDCs) and National Adaptation Plans (NAPs) (SCALA)** programme, which supports decision makers to implement the agriculture priorities of their national climate plans. SCALA recognizes the critical role of the private sector in driving innovation and investment for transformative climate action in agriculture and land use sectors.

SCALA's private sector engagement strategy (FAO and UNDP, 2022a) consists of **three broad areas of intervention (see Figure 1).** This brief corresponds to SCALA intervention area two and provides practical advice on how to translate climate priorities in the agrifood systems into actionable projects by identifying investment opportunities, understanding barriers and risks and selecting de-risking tools to attract private sector investment.

**Figure 1.** SCALA PSE intervention areas




Source: Authors.

This brief on *Understanding opportunities, barriers and risks for private sector engagement in climate action for agrifood systems* provides step-by-step guidance for country planners to identify and understand opportunities and challenges for engaging the private sector in climate action within agrifood systems and work effectively with the private sector to develop investment approaches. It is the third part of a series designed to support national planners and practitioners in working with the private sector on climate-responsive agrifood systems. The series covers:

1. Private sector mapping, outreach and engagement in climate-responsive agrifood systems;
2. Facilitating multi-stakeholder collaboration and private sector dialogues;
3. **Understanding opportunities, barriers and risks for private sector engagement in climate-responsive agrifood systems;** and
4. Developing concept notes for climate projects in agrifood systems.

**Box 2. How to use this brief**

This guidance document is divided into three steps.

**STEP 1: IDENTIFY TRANSFORMATIVE CLIMATE ACTIONS IN AGRIFOOD SYSTEMS.**[1]

- ↗ Identify climate-specific prioritization criteria and evaluate agricultural measures.
- ↗ Identify interventions within a specific priority agrifood system.

**STEP 2: ANALYSE PRIORITY INTERVENTIONS TO DETERMINE THEIR POTENTIAL FOR PRIVATE SECTOR INVESTMENT.**

- ↗ Identify interventions suitable for private sector investment.
- ↗ Assess the bankability of a climate intervention for private sector investment.

**STEP 3: ANALYSE BARRIERS AND RISKS AND IDENTIFY DE-RISKING SOLUTIONS.**

- ↗ Identify and categorize barriers and risks.
- ↗ Rank barriers and risks.
- ↗ Select appropriate de-risking solutions.

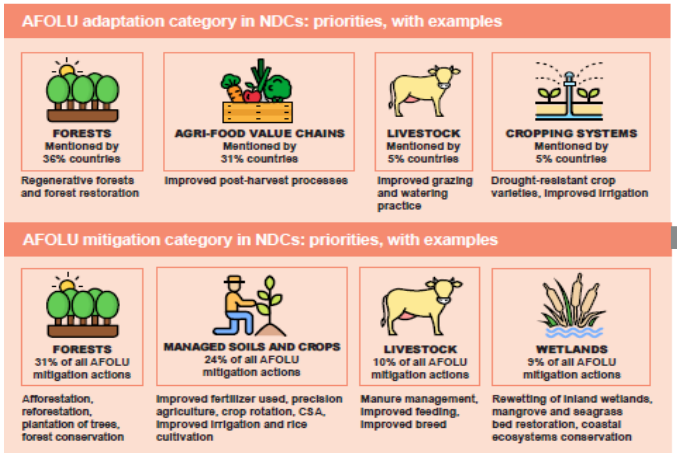
1 Note: Users of this brief may be at different stages of the process of identifying entry points for private investment. This step may be skipped if interventions have already been identified.

# 1. Identify transformative climate actions in agrifood systems

Practitioners should start by reviewing the country's national climate change strategies such as NDCs and NAPs and develop a shortlist of priority actions for agrifood systems[2]. The priority adaptation and mitigation actions for the agriculture and land use sectors can then be further categorized by subsector (including forests, crops, livestock and fisheries) and by different stages of the value chain. These priorities may include a geographical priority or hotspot, a commodity-specific priority or measures such as introducing or expanding agricultural practices or technologies and improving access to information and finance. Figure 2 shows examples of adaptation and mitigation priorities for agrifood systems stated in NDCs worldwide and adaptation measures listed in Uganda's national climate plans.

**Figure 2.** Examples of adaptation and mitigation priorities for agrifood systems in global NDCs and Uganda's national plans

**Global**




**Uganda**

**Examples of adaptation measures in NDC**
Agroecology; water and irrigation; climate resilient crop varieties; post-harvest handling; value addition; productive livestock/livestock diversification.

**NAP-Ag adaptation priorities**
Climate-resilient livestock production systems and value chains in the cattle corridor; promoting and encouraging highly adaptive and productive crop varieties and cultivars in drought-prone, flood-prone, and rainfed crop farming; strengthening climate information systems.

Source: Crumpler *et al.*, 2021

Once a comprehensive list of agrifood system priorities is established, the next step is to select which priorities will be the focus of assessments for private sector investment (Step 2 in this guide). Several tools are available for this purpose, and one example is the Climate Action Review (CAR) Tool (FAO and UNDP, 2024) developed under the SCALA programme. Conducting additional systems-level assessments can be useful to close information gaps related to the selected priorities. A description of these tools and examples of their application is given in section 1.1.

## 1.1. Identify climate-specific prioritization criteria and evaluate agrifood system measures

A set of parameters should be established to identify which agrifood system climate priority to focus on. These may include contribution to adaptation or mitigation, relevance to economic diversification, existing private sector engagement, or contribution to gender inclusion and transformational change (NDCP, 2023).

2 Agrifood systems are systems that encompass the primary production of food and non-food agricultural products, as well as in food storage, aggregation, post-harvest handling, transportation, processing, distribution, marketing, disposal and consumption. Within agrifood systems, food systems comprise all food products that originate from crop and livestock production, forestry, fisheries and aquaculture and from other sources such as synthetic biology, that are intended for human consumption (FAO, 2021b).

Using these parameters, data collection is conducted for each criterion. The data can include qualitative assessments, quantitative measures or scoring methodologies. For example, sectoral experts in the relevant sectors can assess alignment of priorities with national goals on a scale of zero to ten. The selection of specific indicators depends on the availability of data and the feasibility of collecting it (NDCP, 2023).

**The Climate Action Review (CAR) Tool** (FAO and UNDP, 2024) is a useful resource for practitioners to evaluate priorities outlined in NDCs and NAPs for their potential to contribute to transformative adaptation in agrifood systems. The guide helps assess climate priorities according to six dimensions of transformative change including:

1. Is based on a strong climate rationale;
2. Promotes gender equality and social inclusion;
3. Contributes to sustainable development;
4. Fosters a whole-of-government approach:
5. Encourages private sector engagement; and
6. Applies innovative approaches and technologies.

The results of applying the CAR tool can help formulate consensus on which agrifood system priority to focus on in the following steps. An example of the CAR tool's application in a SCALA country is provided in Box 3, highlighting its use in Nepal.

**Box 3. Application of the CAR tool in Nepal**

Nepal's NDC and NAP cover a wide range of agrifood system targets. The country's second NDC outlines 19 agriculture-specific priorities, while the NAP includes nine priority adaptation programmes for agriculture and food security, with an estimated budget of US$11.2 billion by 2050. These measures aim to increase resilience, improve agricultural productivity, conserve agricultural genetic resources and introduce climate-related risk-sharing models tailored to smallholder farmers.

To assess these priorities, the CAR matrix criteria were applied through a combination of literature review, contextual assessment and stakeholder consultation. A comprehensive review of policies and strategies related to agriculture, climate change, forestry and other relevant sectors was undertaken to understand the policy context and guide the development of a shortlist of actions. Several consultations were held with stakeholders from the Ministry of Agriculture and Livestock Development (MoALD) to ensure alignment with the national policy priorities and to refine the list of measures to be screened through the CAR tool. As a result of this approach, the following adaptation and mitigation measures from Nepal's NDC Implementation Plan and NAP were shortlisted using the CAR tool:

1. Soil and nutrient management for resilient agriculture;
2. Development and establishment of climate-friendly farms;
3. Protection, promotion and support of climate-resilient indigenous seeds and plant varieties through community seed banks; and,
4. Development of guidelines to facilitate the integration and scaling-up of gender-responsive and socially inclusive climate-smart technologies and practices.

Source: FAO and UNDP, 2023.

## 1.2. Identify interventions within a specific agrifood system priority

After shortlisting adaptation and mitigation priorities, systems-level assessments[3] can be conducted to appraise climate risks and solutions from social, ecological, economic and political perspectives. This approach can be applied across different subsectors or stages of the agrifood value chains to identify entry points for interventions that meet multiple goals, such as food security, climate resilience, inclusive livelihoods, income generation, environmental restoration and carbon sequestration. These assessments are critical for promoting private sector engagement by mapping various actors along value chains, exploring business opportunities, and outlining strategies to develop low-carbon, climate-resilient value chains with strong private investment potential. Box 4 illustrates how a systems-level assessment can be used to identify interventions in priority landscapes or value chains within a country.

**Box 4. Case study: Using systems-level assessments to identify interventions that can address climate change barriers and risks in Uganda's nationally prioritized cattle corridor**

In Uganda, a systems-level assessment (SLA) was conducted to identify key interventions in the Ugandan cattle corridor, which is a priority area vulnerable to climate change based on the Ugandan NAP for Agriculture. The SLA focused on five districts of the cattle corridor for the integrated systems of livestock, banana, coffee and cassava.

For each value chain, the analysis included:

- The state of natural and agricultural systems and causes of degradation.
- Climate change impacts, vulnerabilities and risks.
- Greenhouse gas (GHG) emissions and removals associated with current agricultural and land use practices.
- Relevant gender and social inclusion issues.
- Mapping of private sector actors and identification of engagement opportunities.
- Identification of barriers and risks, enabling conditions, capacities and resources needed to incentivize transformative climate action.

The following key climate interventions were identified using the SLA for the cattle corridor in Uganda:

- Promoting and encouraging highly adaptive and productive crop varieties and cultivars in drought-prone and flood-prone crop farming systems.
- Strengthening water harvesting and irrigation farming.
- Promoting and encouraging improved post-harvest handling, storage, value addition and marketing.
- Addressing livestock management in the cattle corridor.

Source: FAO and UNDP, 2022b.

3 More information on SCALA systems-level assessments can be found here: hpps://www.fao.org/3/cc0182en/cc0182en.pdf

**CHECKLIST FOR STEP 1:**

- ↗ Identify the most recent versions of relevant climate policies (e.g. NDCs and NAPs)
- ↗ Review these documents to identify priority actions in the agrifood system.
- ↗ Identify priorities and measures with transformational potential using approaches such as CAR tool and SLAs.

**Output:** A comprehensive list of priority adaptation and mitigation measures for agrifood systems with key commodities, climate solutions, interventions and value chains identified for their high potential.

# 2. Analyse priority interventions to determine their potential for private sector investment

Once a shortlist of transformative interventions has been developed, each intervention must be assessed for its potential to engage the private sector and promote market development. This process typically involves two stages. First, categorize interventions that are relevant for private sector involvement, including opportunities for both large-scale investment and smallholder-level improvements. Second, assess the viability and bankability of these interventions from a market and financial perspective. This section delves deeper into assessing the bankability of climate projects using market and financial analyses, focusing on interventions that can support both private sector growth and local entrepreneurship.

## 2.1 Identify interventions that may be suitable for private sector investment

The first stage is to identify and categorize interventions that may be suitable for private sector engagement. An intervention can be categorized as having private sector potential if it has one or more of the following characteristics (Crawford and Church, 2019):

- Activities that private companies can implement to ensure business continuity or increased resilience to climate change;
- Activities that smallholder farmers and MSMEs can implement to increase resilience to climate change and improve productivity;
- Opportunities for the private sector to provide goods and services that can be profitable; and,
- Areas where financiers may potentially invest.

For example, Table 1 categorizes interventions identified through the SLA in Uganda (as outlined in Box 4) according to their potential for private sector engagement.

**Table 1.** Priority interventions identified during the SLA in Uganda categorized according to their potential for private sector engagement

| Private Sector / Public Sector | Cassava | Livestock | Water Management |
|---|---|---|---|
| **Private Sector** | • Offering improved varieties.<br>• Providing processing and value addition equipment.<br>• Introducing solar dryers and mechanical chippers | • Improving manure management through daily collection, heaping under shade and composting. | • Establishing solar-powered small-scale irrigation systems for smallholder farmers outside conventional irrigation schemes. |
| **Public Sector** | • Providing clean planting materials.<br>• Improving infrastructure. | • Modifying the feed basket to reduce grass to 60% and increase legumes to 40%. | • Increasing the construction of water dams, valley tanks, and water reservoirs in water-stressed sub-counties to support crop and livestock production during dry seasons.<br>• Promoting soil and water conservation practices and technologies such as agroforestry, rainwater harvesting and mulching within communities. |

Source: Authors.

Private sector survey tools, consultations with key informants, interviews with government and non-government officials and existing market studies can be used to assess which climate-relevant interventions, identified as priorities for NDC and NAP implementation, will be of the most interest to relevant value chain actors associated with specific priority commodities.

## 2.2 Assess the bankability of a climate intervention

While private sector investment is essential for scaling climate interventions, a broader approach that includes market development and PSE can enhance the impact and sustainability of these initiatives. This involves not only attracting private sector capital but also fostering partnerships that build local capacity, promote entrepreneurship, and support supply chain resilience. By engaging with the private sector across these dimensions, interventions can help stimulate markets and create environments conducive to sustainable growth. The following section focuses on identifying opportunities for private sector investment within this broader context of market development and PSE.

The second stage involves assessing whether an intervention is “bankable” – that is whether it is potentially attractive to investors and financiers such as multilateral development banks (MDBs), impact investors, agrifood businesses or commercial investors.

**Bankability** refers to a set of criteria that investors use to determine the feasibility, profit potential and, in the case of climate interventions, its transformative value. Investors will consider factors like the political and economic environment, financial market conditions, the legal framework, and the reliability of the public sector (Zhu and Chua, 2018). Projects are typically deemed bankable if they are financially viable and offer a reliable return on investment (RoI).

However, the assessment of the bankability of an intervention may vary from one funder to another. The traditional definition of bankability based on the risk–return profile of an intervention mainly relates to financial returns and determines whether the project will be profitable for an investor (Ellis and Pillay, 2017). In the context of climate change or impact investing, bankability also includes climate-relevant or socioeconomic criteria such as improvements in the resilience of communities and alignment with national climate priorities. Figure 3 shows how different actors determine the bankability of climate-smart investments. Understanding the risk appetite and climate impact of investors is important when assessing which measures are best suited for adoption by different types of private sector actors.

**Figure 3.** How do different types of investors identify bankability in climate-smart investments?


Source: *Authors' own adaptation based on* (Ellis and Pillay, 2017).

A key requirement for bankable projects is identifiable and stable revenue streams for traditional investments. Some investments can be made bankable through relatively simple structuring, while in others, there may be no obvious direct revenue streams. There are approaches that can help, such as conditional use of blended finance and other innovative financing mechanisms (World Bank, 2021). Project interventions which are not considered bankable or suitable for a market-based approach will require public finance (domestic, through development partners or from climate funds).

Assessing the potential bankability of an intervention is therefore crucial for distinguishing between interventions that rely solely on public funds and those that have the potential for private sector investment. Practitioners planning to conduct a bankability assessment can use two main approaches: market analysis, and financial analysis and risk assessment.

### 2.2.1. Market analysis

Conducting a thorough market analysis is essential to understand potential demand, the competitive landscape and market trends. This analysis provides insights into market size and demand for specific investments – whether technologies, products or services – which directly impacts revenue projections and investor attractiveness. In addition, a demand analysis provides insights into the long-term sustainability and growth prospects of the project. By examining market dynamics, identifying target demographics and anticipating future trends, potential private sector investors can strategically position their project and emphasize its bankability to potential lenders and investors. For each shortlisted investment area, a comprehensive market analysis should be conducted to assess demand, scalability and understand market dynamics. This analysis forms the basis for the respective intervention, including the identification of the overall investment needs for the region, commodities, technologies or measures concerned. Table 2 illustrates the calculation of the total market size for interventions in the soybean and cattle value chains in Paraguay conducted under a UNDP study aimed at assessing private sector investment potential in the agriculture sector, with a focus on NDC implementation.

**Table 2.** Example of how the total investment potential of agriculture sector interventions in Paraguay's soybean and cattle value chains were calculated

| Value Chain | Intervention Area | Commercial / Family Producer | Baseline Data | Target | Investment Cost (US$/Unit) | Total Investment Potential (US$) |
|---|---|---|---|---|---|---|
| **Soybean** | VRA Technologies | Commercial | 10,469 farms | 50% | 95,750 | 501,203,375 |
| | | Family | 27,585 farms | 20% | 34,300 | 189,233,100 |
| | | **TOTAL** | | | | **690,436,475** |
| **Cattle** | Improved forage | Commercial | 11,455,786 hectares | 25% | 248.09 | 710,516,506 |
| | | Family | 1,851,917 hectares | 10% | 248.09 | 45,944,202 |
| | | **TOTAL** | | | | **756,460,708** |
| | Feedlots (grain silage) | Commercial | 789,588 (heads slaughtered) | 100% | 54.30 | 87,522,454 |
| | | Family | 1,611,952 | 50% | 54.30 | 21,435,709 |
| | | **TOTAL** | | | | **108,958,163** |

*Approach: The investment costs and benchmarks of soybean-related mitigation actions are based on a combination of actual costs in Australia, the United States of America and Canada, and adjusted against the number of farms. See study for reference.*

Source: **UNDP**. September 2020.

When conducting a market analysis for climate relevant interventions, it is essential to consider projected future demand, scalability, competition and barriers to entry. The following approaches can be used for this analysis:

- **Secondary data analysis:** Begin by reviewing sources such as government and industry data and publications to analyse historical market trends, production data and consumption patterns to estimate current and future demand. This data provides a foundational understanding of the market. If secondary data is unavailable, data from interventions in comparable contexts can be used.
- **Primary surveys:** Design and conduct surveys targeting key stakeholders in the agriculture sector such as industry associations, farmer cooperatives and financial institutions. These surveys can provide insights into market demand, supply chain inefficiencies and technology gaps. The data collected will help identify opportunities where the private sector can play a role.

- **Interviews or focus group discussions:** Conduct focused group discussions with relevant stakeholders to gather qualitative insights into consumer behaviour and motivations. This can provide deeper understanding of market drivers that may influence climate-smart investment decisions.

Table 3 outlines the key factors to consider during a market analysis in more detail:

**Table 3.** Factors to consider within a market analysis for assessing bankability

| Factor | Description |
|---|---|
| **How attractive is the market opportunity?** | • Identify the location(s) where the intervention will be targeted.<br>• Analyse the size of the agriculture and land use sector in the target region. This can include data on the number of farms, land area under cultivation, and types of crops or livestock produced.<br>• Assess the potential market share available. This can be done by identifying whether there are existing projects or businesses that are addressing similar challenges and how effective these have been. |
| **Is the intervention financially viable?** | Prepare a detailed financial model that estimates the project's costs and revenue streams. Consider factors like capital investment, operational costs, and potential revenue from climate-related benefits. |
| **What are the social and environmental impacts?** | Assess the social and environmental impact of the project, including its contribution to climate adaptation and mitigation, job creation and community well-being. |
| **What are the climate benefits?** | • Quantify how the project will enhance the resilience of agriculture and land use systems to climate change impacts. Consider metrics like increased crop yield stability or reduced vulnerability to extreme weather events.<br>• Estimate the project's potential to reduce GHG emissions. This can involve calculating emissions reductions from practices such as reduced deforestation, improved soil management or enhanced livestock management. |
| **What is the projected return on investment (RoI)?** | When calculating the projected RoI, stakeholders should consider both the direct financial returns and the value of climate-related benefits. |
| **What are the barriers and risks and how can these be mitigated?** | Identify and quantify potential barriers and risks associated with the investment. Guidance on how to appraise risks and identify appropriate de-risking solutions is covered in Step 3 (Analyse barriers and risks and identify de-risking solutions). |

Source: Authors.

### 2.2.2. Financial analysis and risk assessment for selecting interventions with private sector investment potential.

Accurate financial forecasting is essential for assessing the profitability and sustainability of investments in climate-relevant interventions. This includes:

- **Forecasting revenues:** Estimate potential income generated with or without a climate investment.
- **Estimating costs:** Determine both direct and indirect costs associated with a climate project.
- **Projecting cash flows:** Analyse expected cash inflows and outflows over time.
- **Determining RoI:** Calculate the expected financial return relative to the cost for a climate investment.
- **Calculating payback periods:** Identify the time required to recover the initial investment.
- **Conducting sensitivity analyses:** Assess how changes in key assumptions impact financial outcomes.

Financial institutions and investors scrutinize these projections very closely to assess the financial viability of a climate investment.

In addition, a comprehensive risk assessment is an integral part of a feasibility study to ensure bankability. It identifies potential risks and uncertainties that could affect the feasibility of the projects such as market risks, regulatory fluctuations, operational hurdles and financial uncertainties. After completing assessments for each priority intervention area identified in Step 1, compare and rank the results based on their overall suitability for private investment.

The cost–benefit analysis (CBA) is an analytical tool that can be used to assess the economic and financial feasibility of a project or intervention. The purpose of a CBA is to enable a more efficient allocation of resources by demonstrating the benefits of a particular measure compared to possible alternatives. A CBA compares the projected costs and benefits (or opportunities) associated with a project decision to determine whether the project makes economic sense (European Commission, 2014). Practitioners can use a CBA to assess whether a particular investment will bring benefits to the potential investor that outweigh the costs. The process of conducting a CBA involves:

1. **Setting up a framework for the analysis.** This includes defining the scope of the analysis, establishing what success looks like and decide on metrics to use to measure costs and benefits (e.g. using a specific currency).
2. **Identifying costs and benefits.** The next step is to create lists of all the expected costs and benefits. Costs can include direct costs, indirect costs, intangible costs and opportunity costs. Benefits can include direct, indirect and intangible benefits. When assessing the economic aspects of adaptation actions, three parameters in particular should be considered and compared: the costs of inaction, the costs of adaptation and the (additional) benefits of adaptation (European Environment Agency, 2023). The additional benefits of adaptation are typically assessed by calculating avoided losses. For example, modern irrigation systems as an alternative to rainfed agriculture enhance water efficiency and reduce the negative impacts of climate change on crop yields, thereby improving food security. When assessing the total cost of irrigation technologies, direct costs (equipment and its maintenance) and indirect costs (such as increased energy costs) should be weighed against projected savings from improved water management and higher crop yields.
3. **Assigning monetary values to the costs and benefits.** Once a comprehensive list of costs and benefits has been compiled, a monetary value can be assigned to each of them. Direct costs and benefits are generally easier to quantify, while indirect and intangible costs and benefits, often associated with climate impacts and benefits, may be more challenging.
4. **Tallying the total value of costs and benefits and comparing.** Once a monetary value has been assigned to each cost and benefit item, the total value of costs and benefits should be summed and compared. If the total benefits outweigh the total costs, there is a strong case for proceeding with the project. Conversely, if total costs exceed total benefits, it may be more prudent to explore alternative approaches (Harvard Business School, 2019).

It is important to note that there are distinctions between a financial and an economic CBA.

A ***financial analysis*** focuses specifically on the direct financial costs and benefits to the project stakeholders, such as investors, shareholders or implementing organisations. A financial analysis will consider whether the project is financially acceptable to specific stakeholders and whether certain stakeholders have sufficiently strong financial incentives to participate.

An ***economic analysis***, however, considers costs and benefits to society as a whole, regardless of who pays and who gains. This analysis includes additional costs and benefits beyond those captured in the financial analysis. While the financial analysis examines market-related aspects of the project, the economic analysis evaluates benefits in terms of social well-being and defines costs as reductions in social well-being. The analysis may also account for externalities (e.g. environmental effects) and distortions (e.g. taxes and subsidies) and adjust prices accordingly (Swiss Agency for Development and Cooperation, 2021).

Economic CBAs are useful for public decision-makers when determining the viability of the project or intervention in comparison to alternative approaches. A financial CBA will also need to be undertaken at a later stage by private investors to assess whether it meets their criteria for financial viability. Box 5 illustrates an example of a cost-benefit analysis for a biowaste water treatment system, conducted to provide recommendations on how policymakers can incentivize such climate solutions.

**Box 5. Cost–benefit analysis of installing a biogas wastewater treatment system in Thailand**

Manure management is a government priority in Thailand due to the significant growth of pig production in agrifood system. Nearly 99 percent of the subsector's output is consumed domestically. However, this expansion of pig farming has led to challenges related to GHG emissions, particularly methane, resulting from inadequate manure management practices, as well as water resource contamination and soil degradation.

Thailand's Climate Change Action Plan for the Agriculture Sector (CCAPA 2023–27) emphasizes the country's commitment to align its NDCs and NAPs with climate-resilient agricultural practices. In addition, Thailand's second NDC and long-term low-emission development strategy emphasize the urgent need for adopting appropriate technologies and manure management practices. Thailand's Livestock and Aquatic Consortium Corporation has also pledged to net-zero targets by 2040, focusing on GHG reductions across the production chain.

To address this challenge and incentivize improved practices among private farms, a study under the SCALA programme investigated the economic viability of introducing biogas wastewater treatment systems on medium-sized pig farms. The study assesses the costs and benefits of the technology and explores ways to encourage its adoption through public de-risking mechanisms. Key focus areas included economic viability, GHG reduction, incentive mechanisms, policy recommendations and technological options to improve sustainable management practices. The study:

- Calculates the RoI and GHG reduction costs of installing a biogas wastewater treatment system in medium-sized pig farms.
- Compares GHG emission data between farms with and without biogas technology.
- Conducts a CBA of the biogas technology, analysing the marginal cost of emission reduction.
- Assesses the economic, social and environmental impacts.
- Tallies investment costs, operating costs and income of selected farms to analyse the economic evaluation of biogas technology using key figures such as net present value (NPV), internal rate of return (IRR), benefit–cost ratio (BCR), payback period and RoI.

- Analyses the marginal abatement costs (MAC) for GHG reduction from installing a biogas wastewater treatment plant system.
- Assesses co-benefits such as cost savings, income generation, job creation, odour reduction and community benefits.

The study provides policy and technology recommendations and highlights potential incentives to reduce GHG emissions through the installation of biogas wastewater treatment systems in medium-sized pig farms. For example, targeted policy and economic incentives could encourage the adoption of this technology, achieving the dual goals of lowering GHG emissions while generating renewable energy.

Source: Chaichana, 2024; Government of Thailand, 2022

**CHECKLIST FOR STEP 2:**

- ↗ Assess climate interventions for their private sector investment potential: Identify climate interventions that can attract private sector investment as they can enhance business continuity and increase resilience to climate change interventions. Additionally, assess interventions for their capacity to create opportunities for the private sector to offer profitable goods and services, as well as areas where financiers may consider investing.
- ↗ Assess bankability: Conduct a market analysis for each shortlisted intervention to evaluate market size, growth potential, risks and barriers to entry. Prioritize interventions by applying cost-benefit analyses or financial appraisals to determine their suitability for private sector investment.

**Output:** A comprehensive understanding of market potential and dynamics related to each shortlisted intervention, accompanied by a list of interventions assessed for private sector investment potential.

# 3. Analyse barriers and risks to climate investment and identify de-risking solutions

Assessing the barriers and risks that prevent climate-smart investments is a vital step for attracting the capital needed to drive sustainable agriculture and for fostering private sector engagement in adaptation efforts. Every potential climate investment requires scrutiny to identify these obstacles and develop de-risking solutions to remove barriers and mitigate associated risks. In agrifood systems, numerous factors – internal and external, particularly those related to the enabling environment – introduce structural obstacles or uncertainty that manifests as financial risk. The uncertainty can be perceived as a risk, which can discourage investors or result in higher financing costs. Adaptation investments often require high upfront capital, and the additional financing costs associated with barriers and risks can compromise the financial viability and flow of capital for adaptation measures. The following sub-steps provide a framework for identifying, evaluating and mitigating barriers and risks, including those that may hinder broader private sector participation. They are based on experience from FAO and UNDP projects and from best practices on risk screening, as set out in the frameworks listed in Box 6. These documents can be a useful source of further detail on the approach set out below.

## 3.1. Identify and categorize barriers and risks

For each of the priority actions, practitioners should draw up a comprehensive inventory of the barriers and risks[4] that affect private sector engagement and investment in climate action. This mapping should include policy, regulatory, knowledge-based and financial barriers and risks. While an initial assessment of barriers and risks may have already taken place during consultations with the private sector on adaptation interventions, this stage requires a thorough analysis. This approach will provide a solid evidence base for prioritizing barriers and risks and developing a risk waterfall, as described in 3.2.

First, carry out a thorough literature review to identify barriers and risks affecting different stakeholder groups along the value chain and related investment interventions. Next, the findings can be verified through interviews with key stakeholders representing each actor group within the relevant agricultural value chain. The desk review and stakeholder engagement can be used to answer the following questions (NDCP, 2023):

1. What barriers and risks exist in the regulatory environment, including policy, legal and fiscal constraints, that affect private sector engagement in climate action?
2. What factors contribute to the limited uptake of appropriate climate-smart practices and technologies aligned with NDC investment needs in the agriculture and land use sector?
3. Why have these investments and technologies not attracted significant public and private investment?
4. What alternative technologies and investments are currently being explored and what are the motivations for their adoption?
5. Do women and men have equal access to funding for the introduction of new practices or the acquisition of new technology? What are the reasons for the associated barriers?

4 While barriers and risks are not the same, barriers to private sector investment in adaptation can include financial obstacles, whereas risks may involve supply and demand uncertainties. This document examines the interchangeable roles that barriers and risks play in hindering private sector participation in adaptation interventions.

Barriers and risks associated with the agriculture sector can fall into several categories, including policy and regulatory, financial and economic, information, knowledge and capacity, and production and market barriers and risks. Examples of these categories are shown in Table 4.

**Table 4.** Examples of barriers and risks by category

| Category | Description | Examples of Barrier or Risk |
|---|---|---|
| **Policy & Regulatory Barriers and Risks** | Policy and regulatory barriers and risks broadly refer to challenges and uncertainties arising from government laws, regulations and policies that may impact businesses, industries or individuals to adopt climate-smart practices or invest in NDC/NAP investments. | The lack of a clear strategic and regulatory framework to guide investments in identified agriculture priority interventions can increase the risk profile of investments and can be expensive for investors due to inefficiencies. |
| | | Restrictive regulations or perverse subsidies that constrain business activity and hinder private sector investment in areas that are critical to meeting agriculture-specific climate investment needs to implement NDCs. In addition, regulations that restrict women's access to assets and markets must also be assessed. |
| | | The absence of clear standards and certifications reduces the quality of products in the key markets required for NDC investments. Clearly defined standards facilitate access to finance tailored to officially recognized green or sustainable technologies and investments. |
| | | Inadequate stakeholder engagement in policy formulation causing misalignment. |
| | | Insufficient and/or inconsistent policy support and lack of long-term commitment by the government to support climate-related industries and markets. |
| **Financial & Econonic Barriers and Risks** | In this context, financial and economic barriers and risks refer to factors that affect the ability of individuals or companies to adopt climate-friendly practices for economic reasons, and/or financial services, capital, including loans, deposits, payments, insurance and other risk management services. | Limited availability of relevant financial products to support resilient investments. |
| | | Lack of financial incentives for adoption of low-carbon and climate-resilient technologies and practices. |
| | | High risk perception of the agriculture sector (particularly smallholder farmers and MSMEs). |
| | | The investment time horizons of investors are not aligned with the long payback periods of sustainable agricultural business models. |
| | | Individuals or MSMEs lack the necessary collateral to meet the lending criteria of financial institutions. |
| | | High transaction costs for investments mean that smaller investors are excluded or the investments are too small to fulfil the criteria for donors and other large-scale financing. |
| | | Currency risk – potential depreciation of local currencies against US dollar can lead to increased costs and financial risk. |
| **Information, Knowledge & Capacity Barriers and Risks** | Limited availability of reliable data (including climate information) on which to base decisions, and/or limited capacity of stakeholders to interpret data and make effective decisions. The examples of information, knowledge and capacity challenges presented here may overlap with the factors listed in the other three categories of barriers and risks. | Limited availability of reliable, localized climate data to understand risks and impacts and incorporate them into investment decisions. |
| | | Limited availability and/or adoption of low-carbon and climate-resilient technologies due to knowledge, information and finance gaps. |
| | | Financiers have limited understanding of low-carbon and climate-resilient technologies and business models. |
| | | Lack of communication and knowledge sharing between different institutions results in poorly coordinated responses and duplication of efforts. |
| | | The technologies are new and untested, with little information on potential yields and the associated high risks. |
| | | Environmental externalities are not accounted for, resulting in the investor not understanding the true cost or benefit of the investment. |

| | | |
|---|---|---|
| **Production & Market Barriers and Risks** | In the agriculture sector, technology barriers and risks refer to challenges associated with the adoption, implementation and integration of new technologies.<br>Market risks involve uncertainties related to the sale and distribution of agricultural products, including infrastructure-related barriers. These barriers and risks are often interconnected. For instance, the adoption of certain technologies may be influenced by market dynamics and vice versa. | Inadequate support for the diversification of crops and agricultural practices to build resilience. |
| | | Difficulties in reaching dispersed agricultural communities for value chain development. |
| | | Inadequate infrastructure such as roads, irrigation systems, energy and storage facilities hampering productivity. |
| | | Disjointed efforts and lack of unified strategies among private sector actors. |
| | | Price and demand volatility. |
| | | Prohibitive trade tariffs and other barriers limiting access to new markets. |
| | | Misalignment of agricultural production with market demand. |
| | | Agricultural business associations and farmer cooperatives struggle to engage with the government. |

Source: Authors' own adaptation from different sources (NDCP, 2023; Berliner et al. 2013)

**Box 6. Additional resources for barrier and risk analysis**

- The Climate and Development Knowledge Network (CDKN) has a guide to addressing barriers and risks to climate investment, including an extensive list of barriers and risks. Categories include: externalities and public goods, imperfections in financial markets, risks from new and unproven technologies, information problems and behavioural failure, economies of scale, political and economic risks, and regulatory risks (Berliner *et al.*, 2013).
- The Green Climate Fund (GCF) offers a barrier and risk analysis for crowding in private investment, with similar categories: policy and regulatory barriers, access to climate finance and local markets barriers, affordability and technology barriers, knowledge and education barriers and region and country-related barriers (GCF, 2017).
- The European Bank for Reconstruction and Development (EBRD) has published a guidance note on the *Assessment and management of environmental and social risks and impacts* (EBRD; 2023). This guidance specifies how EBRD clients should assess, manage and monitor their project-related environmental and social risks and impacts in an integrated manner. The guidance may also be useful to non-EBRD clients as a tool to indicate what levels of risk assessment and mitigation is required at different stages of a project and for the different types of finance being sought.
- The Platform for Agricultural Risk Management has developed a toolkit for *Assessing value chain risks to design agricultural risk management strategies* (PARM; 2021).

## 3.2. Rank barriers and risks

After compiling a comprehensive list, the identified barriers and risks should be scored and ranked to identify where de-risking measures are most critical and how to allocate resources efficiently. Barriers and risks are assessed based on two variables (see Table 5 and 6 for examples):

1. **Probability.** The likelihood of a risk event occurring. This can be measured qualitatively (e.g. unlikely versus highly likely) or quantitatively (e.g. a 20 percent probability). For example, if governments frequently subsidize synthetic fertilizers, the probability of discouraging the use of organic fertilizers is high.
2. **Impact.** The extent to which a barrier or risk can affect actors within an agricultural value chain. Impact can also be called severity, magnitude or consequence (PARM, 2021). For example, the impact of subsidies for synthetic fertilizers on farmers organic adoption practices will be high and critical. This can disrupt efforts to promote sustainable agricultural practices, reduce soil health and impact long-term environmental goals. However, it may not be catastrophic, as some organic producers may continue using organic fertilizers due to market or regulatory pressures in niche markets.

For scoring and ranking barriers and risks, it is crucial to assess both the probability and impact of each barrier and risk. If possible, analyse how barriers and risks affect different actor groups within the value chain. The scoring of barriers and risks should be done in collaboration with private sector actors to ensure practical insights into investment needs. There is a variety of quantitative and qualitative tools that can be used to gather data on the probability and severity of barriers and risks.

**Qualitative approaches** may include interviews with key stakeholders, including investors, farmers, policymakers, economists, and other industry experts to gather insights into critical barriers and risks or focus group discussions to bring together diverse viewpoints efficiently.

**Quantitative approaches** may include structured surveys using scales like the Likert scale to rate the severity of barriers and risks. Economic and financial analyses can also be used to estimate potential costs of the barrier or risk, while statistical analyses can be used to assess how barriers and risks have affected similar projects.

It is important to note that certain quantitative approaches (particularly the development of financial models) are likely to be time consuming, require significant technical knowledge and may be expensive to undertake. As such, a decision should be made on the level of detail and data required. For example, for smaller projects or for projects at an early stage of development, a qualitative approach may be sufficient. For larger and more advanced projects, financiers may require deeper and more comprehensive analyses, for which quantitative approaches could be applied.

The risk waterfall method[5] can help rank barriers and risks most critical to private sector investment. This approach enables users to identify the barriers and risks perceived as being the most critical in preventing private sector investment for adaptation, which will inform the subsequent selection of the most effective de-risking instruments (as elaborated in 3.3). The process for creating a risk waterfall is as follows.

5 The methodology employed here draws inspiration from the approach used by the World Economic Forum (WEF) in its annual Global Risks Perception Analysis, which informs the development of the Global Risks Report.

1. Private sector stakeholders should be requested to appraise the shortlisted barriers and risks using a ranking system such as a Likert scale (Pescaroli et *al.*, 2020).
2. Impact is scored on a scale of 1–5, where 5 represents catastrophic impact, and 1 is negligible.
3. Probability is scored on a 1–3 scale, where 3 is high probability and 1 is low.
4. Barrier and risk exposure is calculated by multiplying impact by probability.

Examples are shown in Tables 5 and 6.

**Table 5.** Sample categories for setting an impact score

| Category of Impact | Example of a regulatory barrier or risk: Subsidies for alternative inputs undermining the adoption of organic fertilizers. | Score |
|---|---|---|
| **Catastrophic** | • More than 50% farms will not use organic fertilizer | 5 |
| **Critical** | • 30–50% will not use organic fertilizer | 4 |
| **Considerable** | • 15–30% will not use organic fertilizer | 3 |
| **Moderate** | • 5–15% will not use organic fertilizer | 2 |
| **Negligible** | • 0—5% will not use organic fertilizer | 1 |

Source: Authors.

**Table 6.** Sample categories for setting a probability score

| Category of Impact | Example: If the government subsidizes synthetic fertilizers, the probability of discouraging the use of organic fertilizers is high. | Score |
|---|---|---|
| **Highly probable** | • High likelihood that subsidies for synthetic fertilizers discourage the use of organic fertilizers subsidies to promote certain agricultural inputs to improve short-term productivity | 3 |
| **Probable** | • Moderate likelihood | 2 |
| **Occasional** | • Low likelihood | 1 |

Source: Authors.

**Box 7. Illustrative case study showing how barriers and risks were identified and ranked in Indonesia**

During a UNDP project in Indonesia, the following steps were taken to identify and rank barriers and risks:

1. For each of the project intervention areas, a targeted barrier and risk analysis for adaptation strategies was conducted to establish a shortlist.
2. Stakeholder consultations were held with relevant private sector stakeholders to score the barriers and risks, using a scale of 1–5.
3. A risk index and risk waterfall were developed, which highlighted the most critical barriers and risks.

The results of this stakeholder-driven barrier and risk assessment yielded the following results:

| Adaptation Strategy | Barriers and Risks | Average ranking (scale of1–5) |
|---|---|---|
| **Change Crop Variety** | Lack of demand due to perceived poor taste | 1.9 |
| | Lack of knowledge about benefits | 2.5 |
| | **Inadequate technical knowledge of farmers to grow new varieties** | **4.2** |
| | Lack of access to finance | 1.5 |
| **Organic Fertilizer Usage** | Lack of knowledge about benefits | 0.8 |
| | Lack of knowledge about correct usage | 3.7 |
| | **Reluctance to purchase inputs** | **4.4** |
| **Increase Access to Finance** | Poor financial knowledge of farmers | 3.8 |
| | **High default rates** | **4.7** |
| | **High transaction costs** | **4.7** |
| | Poor risk assessment capacity | 3.1 |

Source: Authors.

## 3.3. Selecting appropriate de-risking solutions

Once barriers and risks have been identified, scored and ranked, the next step is to select the most appropriate de-risking instruments to address each respective barrier or risk. De-risking solutions are designed to remove barriers and mitigate risks and create a favourable environment for private sector investment. Effective barrier removal and de-risking strategies can make adaptation investments more attractive to private sector actors by lowering investment costs or enhancing potential returns. As highlighted in Table 7, de-risking solutions can fall into several categories, including policy de-risking, financial de-risking and technical assistance, amongst others.

**Table 7.** Examples of de-risking tools by category

| Examples of barrier or risk | Policy de-risking | Financial de-risking | Technical assistance |
|---|---|---|---|
| **Policy & regulatory barriers** | | | |
| **Lack of a clear strategic and regulatory framework** | Implement comprehensive climate action frameworks | N/A | Support with policy and/or strategy formulation and regulatory compliance |
| **Inadequate stakeholder engagement in policy formulation causing misalignment** | Mandate multistakeholder inclusion in climate policy processes | N/A | Facilitate stakeholder engagement workshops and processes |
| **Insufficient and/or inconsistent policy support** | Stabilize policy support with long-term commitments | Establish financial protection against policy volatility | Sensitize and update stakeholders on navigating policy landscape |

| | | | |
|---|---|---|---|
| **Lack of long-term commitment by the government to support climate-related industries and markets** | Enact long-term climate action plans with defined roles for the private sector | N/A | Strategic planning support for aligning government and private sector goals |
| **Financial & economic barriers** | | | |
| **Limited availability of relevant financial products to support resilient investments** | Create policies promoting financial product innovation for climate resilience | Create new financial products (green bonds, climate insurance, green loans, guarantees etc.) | Educate financial institutions on need for and design of new financial products |
| **Lack of financial incentives for the adoption of low-carbon and climate-resilient technologies and practices** | Structure financial incentives such as tax benefits for sustainable practices | Offer subsidies and rebates for adoption of climate-resilient technologies | Provide business cases and RoI calculations for green investments |
| **High risk perception of the agriculture sector (particularly smallholder farmers and MSMEs)** | Introduce risk-reducing policies, such as crop insurance schemes | Set up risk-sharing mechanisms like partial loan guarantees | Risk assessment and risk management training for financial institutions; financial training for farmers |
| **Investment time horizons of investors are not aligned with the long payback periods of sustainable agricultural business models** | Create policies to support long-term investments in sustainable agriculture | Design investment funds with patient capital for climate-resilient agriculture | Facilitate the development of long-term business models |
| **Individuals or MSMEs lack the necessary collateral to meet the lending criteria of financial institutions** | Develop alternative credit scoring models, make lending criteria more inclusive | Guarantee facilities and grant provision to reduce collateral requirements | Integrate farming units for higher creditworthiness, financial management training for borrowers |
| **Currency risk – potential depreciation of local currencies against US dollar can lead to increased costs and financial risk** | Implement currency risk management policies | Currency hedging products to protect against fluctuation | Facilitate access to advice on managing currency risk |
| **Information, knowledge & capacity** | | | |
| **Limited availability of reliable, localized climate data to understand risks and impacts and incorporate them into decisions** | Integrate climate risk analysis into national and local planning | N/A | Improved collection and dissemination of targeted climate information |
| **Limited availability and/ or adoption of low-carbon and climate-resilient technologies due to knowledge, information and finance gaps** | Policies to improve extension service support, investment in R&D | Subsidies and tax credits to incentivize investments and adoption | Information campaigns and demonstrations on resilient technologies and practices |
| **Financiers have limited understanding of low-carbon and climate-resilient technologies and business models** | Enact regulations that require considering climate risks as part of due diligence and risk assessment | Dedicated credit lines for resilient investments with clear guidelines and risk assessments | Training to educate financiers on the bankability of CRA technologies and practices, with successful case studies |

| | | | |
|---|---|---|---|
| **Lack of communication and knowledge sharing between different institutions results in poorly coordinated responses and duplication of efforts** | Develop policies to establish formal channels for inter-institutional communication and collaboration on climate action | N/A | Establish multistakeholder platforms for regular dialogue and coordinated action between different actors |
| **Production and market barriers** | | | |
| **Inadequate support for diversification of crops and agricultural practices to build resilience** | Enact policies that encourage diversification of crops and adaptation practices | Provide grants or incentives for adaptation and diversification efforts | Offer extension services to educate on adaptation and diversification benefits |
| **Difficulties in reaching dispersed agricultural communities for value chain development** | Develop policies to expand extension and market access support provided to remote and dispersed communities | Create investment funds targeted at improving rural value chains | Support the development of digital platforms for rural producers and farming unit integration |
| **Inadequate infrastructure such as roads, irrigation systems, energy and storage facilities hampering productivity** | Formulate and implement infrastructure development plans | N/A | N/A |
| **Disjointed efforts and lack of unified strategies among private sector actors** | Establish policy frameworks that incentivize and facilitate collaboration (e.g. attracting private sector consortia through an innovation fund) | Provide financial incentives or subsidies for unified private sector action aligned with national climate goals | Provide technical support for developing platforms to enhance cooperation, including the creation of shared services and resources |
| **Price and demand volatility** | Introduce regulations that support price risk management instruments and contracts, or policies such as price controls | Develop financial instruments (future contracts, options, insurance) to allow businesses to hedge against volatility | Conduct training on financial risk management, market analysis, and adaptive business planning to cope with volatility |
| **Prohibitive trade tariffs and other barriers limiting access to new markets** | Negotiate trade agreements and set trade policy to reduce barriers | Offer financial instruments to offset the costs of tariffs for exporters | Advise on international market access and compliance requirements |
| **Misalignment of agricultural production with market demand** | Develop policies to support market-driven production (certification schemes, traceability requirements, etc.) | N/A | Facilitate access to market studies to guide production, support with market-driven standards and compliance |
| **Agricultural business associations and farmer cooperatives struggle to engage with the government** | Formalized framework for regular consultations and dialogue between public and private sector, including established government liaison | Provide financial incentives for private sector projects that align with national agricultural priorities, promoting greater public–private engagement | Provide technical support to develop private projects aligned with public policies and bridge gap between policy objectives and ground-level activities |

Source: Authors.

De-risking solutions should be selected in consultation with a diverse group of stakeholders. These stakeholders should include key government ministries such as Ministries of Environment; Agriculture, Forestry and Fisheries; Planning; Finance; Water and Irrigation; Lands and Land Use Planning. In addition, development agencies, relevant financial institutions like development banks, microfinance institutions and commercial banks with significant agriculture lending products and portfolios, as well as industry associations, should be involved.

To ensure the chosen de-risking instruments are effective and aligned with broader goals, a CBA can be conducted where applicable to select instruments that maximize economic and social benefits. This approach helps assess the financial implications of investing in adaptation interventions before and after the introduction of de-risking instruments.

Once the de-risking tools are identified, the grouped priority investments should be summarised alongside a set of complementary tools and strategies to overcome the identified barriers and risks. These strategies must be vetted by external stakeholders, including civil society and the private sector, before being approved by the relevant government authority (NDCP, 2023).

**CHECKLIST FOR STEP 3:**

- ↗ For each priority intervention, undertake an analysis to identify a comprehensive list of barriers and risks. Where possible, this should consider barriers and risks from the perspective of different actor groups in the relevant value chain.
- ↗ Score the identified barriers and risks based on their potential impact and probability. Using a Likert scale can help standardize this process.
- ↗ Rank barriers and risks, then verify the results with relevant stakeholders.
- ↗ Engage with stakeholders to identify appropriate de-risking solutions.
- ↗ Validate the de-risking solutions.

**Output:** For each intervention, barriers and risks are identified, scored and ranked. Lists of potential de-risking solutions or policy actions to address the identified barriers and risks are selected.

## 3.4 Using barrier and risk analysis and de-risking solutions to design public and private investment concepts

After identifying and assessing the investment interventions, along with barriers, risks and de-risking solutions, the next step is to develop an investment concept plan. This concept should outline a clear plan with specific activities designed to de-risk the identified barriers, risks and hurdles for implementing the climate solution. The investment concept should detail the proposed interventions, de-risking strategies, key actors to be involved, and a roadmap for execution, ensuring that all components work towards facilitating private sector engagement and successful implementation. The summarised plan should:

- Provide a clear and concise overview of the climate investment needs.
- Highlight key barriers and risks that hinder private sector involvement.
- Outline de-risking solutions that have been identified.
- Assign responsibility to relevant actors for implementing the various measures.
- Estimate the financial resources required for each intervention.

This action plan or investment concept can serve as a **project idea note** to introduce the concept to potential funders or stakeholders; **a concept note** for fundraising efforts, providing the groundwork for detailed project proposals; or as an **implementation plan** for policymakers to integrate into national or regional strategies, ensuring that interventions are aligned with existing frameworks and priorities. The plan should be developed through participatory means to ensure that key stakeholder perspectives are included. Detailed guidance on facilitating multi-stakeholder collaboration and convening private sector dialogues are available in the second brief of this guidance series.

**Key aspects to include in the plan:**

*Part 1: Climate Investment Needs & Budget Requirements*
**Overview of climate investment needs:** Summarize the intervention and its relevance to climate adaptation or mitigation in agrifood systems. For example, small-scale irrigation and climate-resilient crop varieties may be identified as critical for building resilience against droughts and unpredictable rainfall. This section should highlight the scale of the intervention and the geographical areas or hotspots that require attention.

**Budget and resource allocation:** Provide a detailed estimate of the financial resources required for each intervention and associated de-risking solution. For example, an irrigation system may require US$10 million for equipment, installation and training, while a financial de-risking solution could involve establishing a US$5 million risk-sharing facility.

**Alternative financing options:** Identify potential funding sources, such as agricultural credit facilities targeting smallholder farmers, commercial banks that offer specialized financial products for climate-resilient investments, national development banks that could provide concessional loans or grant funding, or international funds which can offer large-scale financing for climate interventions.

*Part 2: Strategies for Mobilizing Resources and Overcoming Barriers*
**Barriers and risks to private sector engagement:** A detailed breakdown of the current challenges faced by private sector actors in investing in the proposed interventions. For instance, barriers and risks to small-scale irrigation systems may include limited access to finance, lack of technical knowledge, insufficient infrastructure and regulatory challenges.

**De-risking solutions:** Identify potential solutions to address these barriers and risks. De-risking mechanisms may include:

- **Technology de-risking:** Offering incentives for adopting climate-smart technologies, such as subsidies for irrigation equipment or drought-resistant crop varieties.
- **Financial de-risking:** Providing blended finance solutions, such as credit guarantees or risk-sharing facilities, to reduce the perceived financial risk for investors.
- **Policy de-risking:** Implementing regulatory reforms to simplify market access and support private sector involvement through tax breaks or improved trade policies.

**Actor responsibility and engagement:** Clearly define the roles and responsibilities of various actors. This should include public sector entities (such as ministries of agriculture or environment), private sector companies (input suppliers, agrifood processors, financial institutions), and community organizations or cooperatives. Each actor's role in addressing specific barriers and risks should be detailed, along with how they will contribute to achieving the overall objective of implementing agrifood priorities in NDCs.

Table 8 illustrates an example of an investment concept plan for prioritized climate interventions for advancing agrifood priorities outlined in NDCs and NAPs.

**Table 8.** Example of a summarized plan for prioritized interventions/investment needs

| Element | Key evidence to be summarized based on the analysis and steps undertaken above |
|---|---|
| **Investment opportunity in transformative climate action** | Small-scale irrigation and climate-resilient crop varieties |
| **Scope** | Key geographical zones most affected by climate variability such as semi-arid districts or drought-prone regions |
| **Budget required** | US dollars per intervention/investment need and de-risking solution |
| **Alternative financing options** | Agriculture credit facility, commercial banks focusing on agriculture, national development banks |
| **Climate risk and climate impact that the solution is addressing** | Droughts, unpredictable rainfall leading to water insecurity, reduced crop yields or shifting farmer practices |
| **Current risks and barriers to private sector investment in small-scale irrigation and climate-resilient crop varieties** | Access to inputs, limited climate and market information, technical knowledge, water resources, limited finance, infrastructure, market demand, government policy barriers, access to markets, etc. |
| **Potential de-risking solutions** | Potential solutions to the challenges that the businesses are facing for each of the barriers mentioned above, by different actor types, e.g. enabling access to climate resilient inputs through technology de-risking or financial de-risking |
| **Value chain actors relevant in this climate context** | Key private sector actors in the value chain impacted by climate change and/or who see opportunities to invest, e.g. input suppliers that can provide irrigation equipment; production companies and farmer associations/cooperatives affected by water insecurity |
| **Specific actors and the role they can play** | Input suppliers providing irrigation equipment; agrifood companies supporting technology adoption; cooperatives ensuring farmer engagement; government extension services providing climate information services. |

Source: Authors.

This provides decision-makers with a clear roadmap to overcome barriers and risks, leverage de-risking mechanisms, and effectively engage the private sector in climate investments. A detailed overview of how to develop proposals for resource mobilization for climate interventions, using the information shared in this document, can be explored further in the fourth brief of the PSE guidance series, which focuses on enabling investments and concept note development.

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The Support Programme on **Scaling up Climate Ambition on Land Use and Agriculture through Nationally Determined Contributions and National Adaptation Plans (SCALA)** is a seven-year initiative led by FAO and UNDP, with funding from the German Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection (BMUV) through the International Climate Initiative (IKI). SCALA responds to the urgent need for increased action to cope with climate change impacts in the agriculture and land use sectors. The twenty-six million euro programme supports at least twelve countries in Africa, Asia and Latin America to build adaptive capacity and to implement low emission priorities.

Country support includes strengthening policies, adopting innovative approaches to climate change adaptation and removing barriers related to information gaps, governance, finance, gender mainstreaming and integrated monitoring and reporting. To achieve this shift, the programme engages the private sector and key national institutions.

SCALA supports countries to develop the capacity to own and lead the process to meet targets set out in their National Adaptation Plans and Nationally Determined Contributions under the Paris Agreement, and to achieve the Sustainable Development Goals. The SCALA initiative builds on another FAO-UNDP led programme, Integrating Agriculture in National Adaptation Plans (2015-2020).

**Food and Agriculture Organization of the United Nations**
www.fao.org/in-action/scala/en

**United Nations Development Programme**
www.adaptation-undp.org/scala

**International Climate Initiative (IKI)**
www.international-climate-initiative.com

**German Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection (BMUV)**
www.bmuv.de/en/

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