Assessing Climate Risk, Framing Resilience, and Reporting Impact: A Guide for Climate Finance Practitioners

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CLIMATE POLICY INITIATIVE

DOCUMENT OVERVIEW

Physical climate hazards are intensifying. Droughts, floods, extreme heat, storms, and sea level rise pose increasing threats to livelihoods, infrastructure, business assets, and supply chains worldwide. To remain viable and effective, all investment vehicles must embed climate risk management into their design and execution. Other finance vehicles will also be needed to proactively mobilize capital specifically to solutions that build resilience to these hazards.

Since 2015, Climate Policy Initiative (CPI)'s Global Innovation Lab for Climate Finance (the Lab) and the Catalytic Climate Finance Facility (CC Facility) have supported the development and implementation of more than 40 adaptation-relevant financial vehicles. Because adaptation benefits are context-specific, these vehicles were designed and implemented in close collaboration with local stakeholders, drawing on their knowledge of local markets, institutions, and ecosystems to address specific climate risks. Consultation with local financial institutions, project developers, and community partners grounds vehicle design in local realities, strengthening both the financial performance and real-world impact of adaptation-relevant investments.

Lab and CC Facility vehicles have supported diverse financial mechanisms for strengthened adaptation, including:

- A servitization approach for clean cooling installation to respond to extreme heat risk.
- Equity funds investing in adaptation-focused technology and services companies.
- Debt facilities providing capital to climate-smart agri-SMEs.
- Parametric insurance to build long-term resilience against wildfires and ecosystem degradation.

CPI has also helped non-adaptation specific vehicles create practical frameworks for assessing and managing their climate risk to improve bankability.

Informed by over a decade of work with these vehicles, this guide supports funders, investors, implementers, and technical partners working on climate finance vehicles to manage climate risk and design investments with material improvements to resilience.[1] Its users may include fund managers establishing a new equity fund, coalitions of actors issuing climate-related bonds, or other implementers of private sector vehicles seeking to mobilize capital for climate projects. This guide is most relevant to leadership teams shaping and articulating climate risk management strategies, and for those responsible for impact measurement and reporting.

> We understand adaptation finance as resources directed toward activities aimed at reducing the vulnerability of human or natural systems to the impacts of climate change and climate-related risks, by maintaining or increasing adaptive capacity and resilience.

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1 In this guide, CPI uses the terms climate adaptation and climate resilience interchangeably, though some practitioners distinguish between them, where adaptation represents the set of actions and activities that contribute to resilience as the end goal or outcome.

This guide's support is structured around three core goals:

First

for all climate finance vehicles

GOAL 1
Assess and manage your climate risk to align with international standards and funder expectations.

Then

for vehicles that help build climate resilience

GOAL 2
Define your adaptation investment thesis, making a clear case for how and why the vehicle strengthens climate resilience.

GOAL 3
Design a fit-for-purpose impact measurement and reporting strategy that captures adaptation and resilience outcomes.

HOW TO USE THIS DOCUMENT

This guide aims to support teams in structuring approaches to invest in climate solutions across sectors and geographies. It aims to be comprehensive, though different sections will be useful for different audiences, depending on their objectives.

As climate risk becomes increasingly integral to investment decision-making, some users will focus on understanding how to assess and manage their risk exposure (Goal 1). Teams looking to move beyond risk assessment and management to proactive adaptation investment strategies may use goals 2 and 3 to frame their adaptation thesis and build a framework for monitoring impacts.

For each goal, this guide outlines:

A. **Why it matters:** Context on why the goal is critical to investment vehicles' success.

B. **How to do it:** Guiding questions, tips, and practical advice for achieving the goal.

C. **Outputs and resources:** Templates, examples, and resources to put the goal into action.

The Appendixes also provide templates, examples, and additional resources to further support the goals.

Climate finance vehicles

CPI's programs support the design and development of climate finance vehicles that can de-risk transactions and mobilize capital. Climate finance vehicles channel the flow of capital to efficiently deploy investments in climate mitigation and/or adaptation projects on the ground. These financial mechanisms include debt or equity funds, credit enhancement mechanisms such as insurance and guarantee structures, as well as results-based finance models such as payment for ecosystem services or impact-linked debt.

GOAL 1: ASSESS AND MANAGE YOUR CLIMATE RISK

1A. WHY ASSESSING AND MANAGING CLIMATE RISK MATTERS

Managing physical climate risk is a core element of financial management and broader enterprise risk management. Integrating climate risk considerations can strengthen financial performance, enhance alignment with funder expectations, and safeguard communities and assets. Climate risk assessment and management are critical for all financial vehicle implementers:

1. **To protect business performance and align with private investors.** The near-term certainty of growing climate impacts is well-documented: 200 of the largest companies have collectively estimated over USD 1 trillion in climate change-related financial risk. Finance vehicle implementers that proactively manage these risks can reduce risk exposure to climate shocks and extreme weather, while protecting operational and financial stability. Doing so also positions teams to align with potential investors from private financial institutions, which are increasingly integrating climate-related risk assessments into investment decisions.

2. **To assess and address potential maladaptation risk.** Maladaptation occurs when an activity or investment increases social vulnerability, causes unintended harm to humans, increases climate-related impacts on ecosystems, worsens the present or future condition of marginalized groups (such as low-income households, ethnic minorities, and women), inhibits deep and systemic change, or results in additional emissions.

   Assessing and managing physical climate risks in the geographies where your vehicle will be implemented, alongside broader socioeconomic, political, and environmental risks, can help reduce the likelihood of maladaptation. The "Do No Significant Harm" principle of the EU's Sustainable Finance Taxonomy is valuable when thinking through how to mitigate potential negative impacts across social and environmental objectives.

3. **To comply with International Sustainability Standards Board (ISSB) Standards.** The ISSB Standards are now the global baseline for sustainability- and climate-related financial disclosure, and understanding them will support partner engagement. Regulators and funders in jurisdictions including Singapore, Canada, Germany, France, and the UK are mandating or aligning national disclosure requirements with these standards. While these standards may not apply to all financial vehicles, it will increasingly affect those seeking funding from actors in these markets.

   The ISSB Standards retain and deepen the core pillars of disclosure established by the Task Force on Climate-related Financial Disclosures (TCFD), including:

   a. **Governance:** Oversight of climate-related risks and opportunities—including acute and chronic physical risks—at board and management levels, and integration of these considerations into decision-making.

   b. **Strategy:** Assessment of how physical and transition climate risks affect business models, assets, and value chains over the short, medium, and long term, including analysis of organizational resilience under multiple climate scenarios.

c. **Risk management:** Processes for identifying, assessing, and managing climate-related risks, including the integration of physical risk analysis (e.g., asset-level hazard exposure) into enterprise risk and adaptation planning.

d. **Metrics and targets:** Disclosure of metrics and targets used to assess and manage climate-related risks and opportunities, such as exposure to physical hazards, investment in resilience measures, and progress toward adaptation objectives.

4. **To meet public funders' requirements for Paris-aligned climate risk management.** Vehicles seeking funding from governments and multilateral actors, will increasingly be required to have climate risk strategies that align with the Paris Agreement goals. According to the Multilateral Development Bank (MDB) Joint Framework, to pass the "Paris-aligned" qualification for MDB funding, projects must meet certain mitigation and adaptation standards, including the following two criteria for adaptation:

   a. Physical climate risks have been identified and managed.

   b. Activities do not undermine climate resilience in the context in which the project takes place.

1B. HOW TO DO IT: FIVE STEPS FOR ASSESSING AND MANAGING CLIMATE RISK

Investment vehicle designers can take five key steps to assess and begin to manage their physical climate risks:

Step 1: List all possible end-users/beneficiaries as well as relevant assets, infrastructure, or supply chain nodes of your investment pipeline.

- **End-users/beneficiaries:** For example, if investing in agri-SMEs, this would include the SMEs themselves, farmers/value chain participants who use their services/outputs, and consumers who ultimately purchase the relevant products.
  - While mapping these groups, note their gender composition, as women and men often engage in different parts of production and value creation, shaping their exposure to climate risks and adaptive capacity.
- **Assets and infrastructure:** This could include buildings, storage facilities, processing equipment, distribution centers, roads, among others.
- **Supply chain:** Upstream input suppliers, transportation routes, cold chain logistics, downstream distributors.

Step 2: Determine the geographic bounds of end-users, assets, infrastructure, and supply chain components.

- Map where all components of your investment ecosystem are located. This should go beyond headquarters and production sites to include areas where raw materials are sourced, and final products are delivered.

Step 3: Identify the current or anticipated climate hazards in relevant geographies for end-users and ecosystem components.

The IPCC's set of climate hazards can be used as a guide:

ACUTE CLIMATE HAZARDS	CHRONIC CLIMATE HAZARDS	
Heat waves	Changing temperature	Ocean acidification
Wildfire	Heat stress	Sea level rise
Storms and cyclones	Temperature variability	Drought/water stress
Heavy precipitation	Changing precipitation patterns and types	Coastal erosion
Riverine and coastal flooding	Precipitation and/or hydrological variability	

- Additional resources from a range of providers to support climate hazard identification and mapping are listed in Appendix 3.
- A list of physical and transition risk assessment tools, adapted from British International Investment (BII) analysis, can also be downloaded here.

→ See **Appendix 3** for more tools on climate hazard identification

TIP: Evaluate more than one climate scenario in identifying the potential presence of and severity of climate hazards. Scenario planning helps to avoid underestimating risk by testing how investments perform under different possible futures from relatively low-emissions scenarios (RCP4.5) to medium- or high-emissions scenarios (RCP6 or RCP8.5).[2] Many of the resources in Appendix 3 have scenario analysis embedded.

Step 4: Narrow down the list of potentially relevant hazards from Step 3.

The next step is determining the hazards to which the vehicle itself has plausible or probable exposure and which of those hazards would be material to the investment.

→ See **Appendix 1** to see Steps 1-4 in action

- **Exposure can be direct** (e.g., a storage facility in a flood plain) **or indirect,** such as through supply chain dependencies (e.g., an eroding coastal delivery road).
- **Vehicles may also consider anticipated risks:** Hazards that could emerge over the short or medium term but do not yet pose a material risk. Including these forward-looking risks can support proactive risk management and help ensure that the investment remains resilient over time. The relevance of anticipated risks should be reassessed periodically, as climate conditions, exposure, and asset lifetimes evolve.
- **Consider how hazards could affect financial performance or default risk.** For example, lending to farmers in regions prone to heatwaves or floods could reduce crop yields, increase loan default rates, or disrupt revenues. Citing observed losses from past extreme events can help strengthen your case and illustrate materiality.
- **It is important for vehicles to consider the different needs of end-users**—including women and people with disabilities—as these will shape how they engage with and benefit from the investment

2 Representative Concentration Pathways (RCPs) describe plausible future climate scenarios based on different levels of greenhouse gas concentrations. The numbers refer to the approximate level of radiative forcing (measured in watts per square meter) reached by 2100 (e.g. RCP8.5 corresponds to ~8.5 W/m²).

pipeline. For example, women farmers may face barriers to accessing agricultural inputs, including climate-smart products, influencing how they benefit from the investment pipeline.

Step 5: Build a clear plan to manage the identified risks.

Once you have identified relevant climate risks using steps 1-4, you will need a plan to manage those risks. A risk management plan covering short-, medium-, and long-term horizons can signal to investors that you have planned to make your approach resilient to shocks and stresses in the market. These plans require careful consideration, including an assessment of the potential financial impact of identified risks at different levels of the investment portfolio. Participants in the Lab and CC Facility programs receive tailored, comprehensive and targeted support to develop climate risk management plans. Given the unique vulnerabilities of different financial vehicles, umbrella recommendations are not possible. Generally, key actions include:

- Outlining the actions that your team will take to reduce risks associated with the identified climate-related vulnerabilities, estimate their potential financial implications, then assign responsibility for implementing those actions and describe how you will monitor progress over time. Pre-defining key performance indicators or intermediary result targets can help assess progress.
- Integrating climate-related risk management into investment pipeline evaluation and into your planned support for investment beneficiaries, including contingency measures for extreme events, such as emergency resources or insurance, and consider how these risks might affect financial performance across different investment scenarios.
- We recommend the following resources when building a management plan:
    - **UNEP FI:** Adaptation and Resilience Investors Collaborative: Physical Climate Risk Assessment and Management: An investor playbook
    - **ADB:** Principles of Climate Risk Management for Climate Proofing Projects
    - **IIGCC:** The Physical Climate Risk Appraisal Methodology 2.0 [for infrastructure-focused vehicles]

Example 1: Uncovering impact to unlock funding

In completing the risk assessments outlined in Goal 1, several CPI-supported instruments uncovered new ways to frame their impacts. Cooling as a Service (CaaS)—a pay-per-service model for clean, efficient cooling—entered the Lab support process focused solely on reducing emissions. During the process, the team identified major adaptation co-benefits for health and food systems stemming from improved energy efficiency and cleaner refrigerants, recognizing that these benefits directly address the growing climate hazard of extreme heat. The benefits included reduced food waste, improved labor productivity, and decreased loss of cold-chain dependent medicines. Developing an adaptation thesis unlocked a new set of funders in their fundraising efforts.

1C. OUTPUTS AND RESOURCES FOR ASSESSING AND MANAGING CLIMATE RISK

After following the steps for assessing climate risk in Section 1B, you should have the outputs listed below. These outputs are valuable not only for managing the risk to your financial vehicle's operations, but also for engaging investors.

- **Risk assessment:** A risk assessment, following the first four steps outlined in Section 1B, provides a useful starting point for identifying a risk management approach.
- **Risk management plan and pipeline screening criteria:** Vehicles should develop a plan for managing risks identified in their risk assessment—both for their own assets and for beneficiaries. This process will vary across vehicles and can also be integrated into their investment pipeline development. Appendix 2 outlines key criteria that portfolio companies can be assessed against and supported on to strengthen their climate risk management.

→ See **Appendix 2** for a sample risk management criteria for pipeline companies

- **Maladaptation assessment**: Understanding how an investment affects communities along the value chain is essential to preventing maladaptation and ensuring that investments strengthen, rather than undermine, local resilience. Managing maladaptation risk is an important part of sustainable development, and vehicles need clear plans to address social, economic, and environmental impacts to qualify for funder support. CPI's Knowledge and Capacity Building Platform will produce more resources on screening for maladaptation as part of its series on climate adaptation finance.

GOAL 2: DEFINE YOUR ADAPTATION THESIS

While all financial vehicles should assess and manage their climate risks in line with Goal 1, those that intentionally aim to mobilize resources that reduce human, ecosystem, or business vulnerability to climate risks should go further to build an adaptation thesis.

2A. WHY DEFINING AN ADAPTATION AND RESILIENCE THESIS MATTERS

Financial vehicles that explicitly aim to reduce vulnerability to climate risk must explain how they will build climate resilience by strengthening systems or beneficiaries against identified hazards. A clear, evidence-backed narrative—or adaptation thesis—is critical to establishing a robust impact framework, building partner credibility, and securing investor commitments.

Building an adaptation thesis that aligns with funder expectations can improve access to adaptation-focused investment themes, strengthen accountability to beneficiaries, and increase the likelihood of delivering measurable resilience outcomes.

When defining your adaptation thesis, it is important to identify your relevant investors and understand their requirements. Depending on your capital stack, you may need to tailor your thesis to meet the requirements of multiple funders. Public financial institutions have varied requirements for framing adaptation-focused investments, making it useful to be strategic when preparing your justification. In many cases, aligning your thesis with the most stringent requirements enables you to meet other framework criteria with minimal adjustment.

In practice, defining an adaptation thesis means ensuring your narrative reflects funder criteria by demonstrating a clear link between the climate hazards you identified, the vulnerabilities of target beneficiaries or systems, and how your intervention reduces those vulnerabilities. While some funding institutions provide templates, most issue guidance or minimum requirements rather than a prescribed format.

2B. HOW TO DO IT: FRAMING AN ADAPTATION AND RESILIENCE THESIS

Begin with the work completed under Goal 1B Steps 1-4: identifying end-users or beneficiaries, and relevant assets, infrastructure, and supply chain components and associated geographic boundaries of those components and the material physical climate hazards affecting them.

Next, document how the planned financed intervention will reduce the vulnerability of the identified components to the specific climate hazards or impacts you identified. This analysis can be captured in a simple spreadsheet or Word document.

TIP: Adaptation theses should be succinct and clear. Avoid overly long or convoluted explanations. Begin with a concise definition of the climate risks addressed and clearly show your investment's link to the intended impact.

Different interventions will take different approaches to articulating their adaptation thesis, as illustrated in the examples below:

- An equity fund investing in agri-SMEs offering digital services that connect farmers to personalized agronomy support to sustain yields in the face of climate change could note how those services will help end-users become less vulnerable to changing, shifting rainfall patterns and temperatures.
- A vehicle supporting a solar mini-grid developer that installs systems in communities prone to climate hazards could highlight how the resulting distributed clean energy systems provide reliable power and reduce vulnerability of households and small businesses during extreme heat or flooding.
- A microfinance institution providing loans for households to retrofit homes with flood- or heat-resilient features, such as elevated foundations or storm-resistant roofs, could highlight reduced end-user vulnerability to extreme wind and hurricanes.

You may need to define your investment thesis for multiple types of funders, which may have different approaches to framing investments as adaptation. CPI works with Lab and CC Facility proponents to build an investment thesis tailored to the capital stack and structure of different vehicles.

ALIGNING WITH MDB REQUIREMENTS

For vehicles targeting public investment, it is important to consider alignment with the MDB adaptation finance criteria. The MDBs provide a range of resources to help inform thinking on vulnerability reduction, including guidance on what qualifies as an adaptation investment. MDB guidance highlights three core requirements for qualifying an investment as adaptation:

- **Requirement 1**: Has the context of climate change vulnerability been set out?
- **Requirement 2**: Is there an explicit statement of intent to reduce the identified climate change vulnerability?
- **Requirement 3:** Is there a direct link between the project activities and the identified climate change vulnerabilities?

Tips on aligning with MDB guidance:

- **Align with time horizons:** Ensure that the climate hazards you consider match the intended lifespan of your project's activities. For activities without clear lifespans (e.g., certain nature-based solutions or investments in operational expenses) choose an appropriate timescale for projected climate change impacts.
- **Assess tracking capacity:** Check whether end-users can identify and report on adaptation activities themselves. Look for signs like dedicated climate mandates, a risk management system, the disclosure of physical climate risk, or other processes that can support the identification of physical climate risk and adaptation activities.
- **Centralize data if needed:** If end-users/beneficiaries lack reporting capacity, plan how to collect relevant information at a centralized level.
- **Leverage taxonomies:** Reference existing taxonomies to identify which types of activities qualify as adaptation in different contexts and ensure alignment with recognized standards.

Example 2: Unlocking investment

Growth equity fund Climate Resilience and Adaptation Finance and Technology Transfer Facility (CRAFT) invests in companies in developed and developing countries that have proven technologies and solutions for climate resilience and have demonstrated market demand and revenue. The Lab supported the team in crafting an adaptation thesis, helping CRAFT to align with Green Climate Fund (GCF) criteria. The facility ultimately secured a USD 100 million GCF commitment to support adaptation investments in six new countries.

2C. OUTPUTS AND RESOURCES FOR DEFINING YOUR ADAPTATION THESIS

The steps in Section 2B should yield the below outputs, which can also be used to inform fundraising strategies.

Resources like the Climate Bonds Resilience Taxonomy and CPI's Adaptation Tracking Taxonomy provide practical guidance for identifying, classifying, and reporting on climate adaptation activities. They help practitioners link investment activities to recognized resilience outcomes, select relevant indicators, and ensure consistent, credible tracking of adaptation progress across projects and portfolios.

- **Narrative frames:** Paragraph-length descriptions of a high-level adaptation thesis can articulate vehicle impact in investor materials and pitches.
- **Spreadsheet analysis:** Building on the Risk Assessment template in Appendix 1 teams can expand their analysis to show how each portfolio company plans to address climate vulnerability and which specific climate risks they target for end-users or beneficiaries. The analysis should also evaluate the strength of the adaptation thesis, distinguishing between direct effects in reducing exposure or vulnerability (e.g., creating flood barriers or providing drought-resistant seeds) and indirect effects that amplify resilience (e.g., creating data platforms or weather monitoring systems). This analysis can also feed into the narrative frames above.

→ See **Appendix 4** sample adaptation thesis framing from past CPI-supported instruments

GOAL 3: DESIGN AN IMPACT MEASUREMENT AND REPORTING STRATEGY

After defining your adaptation thesis, your next step is to develop a fit-for-purpose adaptation strategy. This strategy supports operationalizing your adaptation thesis, including outlining how your vehicle intends to address climate risks and support resilience outcomes through its capital structure and pipeline selection. While this is an important step, the focus of this strategy will vary by vehicle, and the Lab and CC Facility can provide individualized support in this area.

The adaptation strategy can be developed after, in parallel, or iteratively with the investment strategy. **The strategy should outline priorities for action, informing the next step: creating a measurement framework that delivers efficient, evidence-based, and stakeholder-relevant insights on climate resilience outcomes.**

3A. WHY MEASURING PROGRESS MATTERS

Measuring impact is important because:

1. **Indicators of progress enable organizations to prioritize investment** in activities with the most significant impact potential and to track reliable and comparable physical climate-related information on investments.
2. **Robust impact tracking can help manage against maladaptation** by revealing unintended consequences—like an irrigation project that improves yields but depletes local water sources—which allows vehicles to adjust interventions as needed.
3. **Leading donors like the GCF and other MDBs increasingly request quantitative adaptation metrics.** When effective, metrics typically relate directly to the vehicle's core business activities and hold high relevance for key stakeholders, including shareholders, potential employees, and beneficiaries.

3B. HOW TO DO IT: BUILDING AN IMPACT MEASUREMENT FRAMEWORK

There are numerous challenges to measuring impact and progress in adaptation, given the context-specific nature of adaptation needs, the multidimensional nature of adaptive capacity, and challenges of measuring actual outcomes against immeasurable counterfactual outcomes.

> **TIP:** Be aware that there are many guidance documents available in this space and know that there is no "perfect, universal" approach to measurement.

Public and private investors have varied requirements, request the use of different reporting frameworks, and are rapidly evolving their thinking on adaptation and resilience impact measurement. The goal is to do the best you can to develop a justifiable, reasonable, and stakeholder-relevant framework, as detailed below.

Key framing questions to develop an adaptation impact measurement framework:

- **What adaptation value matters to your beneficiaries?** Consider the most relevant outcomes for your end-users. What elements of resilience are most important to them?
    - For example, if investing in SMEs focused on water reuse technology, you may identify the key climate risks you aim to help those founders address and what kinds of benefits will be most appealing (e.g., increased water efficiency, volume of water treated and recycled, improved water reliability during drought events, etc.).
    - Consider whether these outcomes differ for women and men, who may have varying roles, responsibilities, or constraints affecting their climate vulnerability and ability to benefit from interventions.
- **What are your funders asking?** What requests are you receiving from potential and current funders around adaptation and resilience impact? Are there specific requirements (e.g., reporting frameworks or metrics) already outlined?
- **What data can you realistically and affordably collect?** Assess what data is feasible to capture from end-users and beneficiaries. Put simply: Avoid impact metrics that you will not reasonably be able to collect against.
    - Where relevant and feasible, consider partnerships with other organizations/companies that can facilitate data collection and analysis (e.g., companies operating on-farm sensors).
    - Where possible, collect and track gender-disaggregated data to understand differentiated adaptation impacts.
    - If you cannot measure adaptation outcomes through specific indicators like revenues or yield volumes, considering self-reported change in adaptive capacity—from end-users, often farmers and communities—can be a good alternative. There are multiple specialist organizations, such as 60 Decibels, that can support the design of these assessments.

Example 3: Measuring what is reasonable

One Acre Ventures, a subsidiary of One Acre Fund, is a Lab- and CC Facility-supported debt and equity fund that coordinates investments in agri-SMEs across high-value, climate-resilient crop value chains in East Africa. Its impact measurement draws on One Acre Fund's approach for smallholder programs and relies on data reported by portfolio companies. While agricultural outputs, job creation, and farmer income are trackable, monitoring more rigorous climate metrics—like soil nutrient depletion and restoration—is logistically challenging and resource-intensive. Instead, One Acre Ventures estimates these impacts using data from similar interventions elsewhere.

3C. OUTPUTS AND RESOURCES FOR ACHIEVING GOAL 3

After following the steps in Section 3b, you should have the outputs below. The outputs should help demonstrate to funders that your measurement approach is thoughtful and realistic, which can help inspire confidence in the team and vehicle.

Outputs:

→ **Appendix 5** captures a potential outline for structuring an effective theory of change

- **Theory of change:** A representation of how a vehicle's core activities lead to its outputs (the direct, tangible results), its outcomes (the resulting changes or effects), and ultimately the broader impact or goal that anchors its investment thesis.
- **Impact measurement framework:** A structured document linking your adaptation thesis to measurable outputs, outcomes, and resilience impacts. This provides a clear line of sight from activities to adaptation results for funders, implementers, and beneficiaries. It should also have a defined timeline for achieving impact targets including short, medium, and long-term milestones.
- **Indicator and metrics table:** A concise table showing key quantitative and qualitative indicators, units, frequency of measurement, and data sources. This makes it easier to track progress consistently across portfolio companies or projects. Where possible, disaggregate data by gender to capture any differences in outcomes for women and men.
- **Baseline assessment:** A snapshot of current conditions against which adaptation outcomes will be measured. Baseline data helps demonstrate change over time and ensures accountability to stakeholders.
- **Data collection plan:** Specifies who collects which data, when, with what frequency, and how. This supports efficient and accurate measurement, particularly when end-users have limited capacity to report adaptation outcomes. This process should come before data is collected, and it helps to support overall accountability.

Some additional resources that may support the construction of an impact measurement framework include:

1. **MDBs and International Development Finance Club members:** **A Framework and Principles for Climate Resilience Metrics in Financing Operations**, introducing a results-chain approach to measuring how financing contributes to climate resilience—from project inputs and activities to outputs, outcomes, and impacts. It emphasizes context-specific, flexible metrics that account for uncertainty, long timescales, and diverse climate vulnerability contexts, aiming to strengthen how institutions assess and report their resilience impact. The Framework provides sectoral-level guidance with examples of outcome and output indicators within the results chain.
2. **EBRD:** **Green Economy Transition framework** **(GET)** as captured in **Appendix 6**, including a set of categories proposed as key metrics to measure in relation to work on climate resilience bonds that may be useful as aggregate indicators for adaptation outcomes.

→ **Appendix 6** highlights examples of sector-specific aggregate adaptation indicators from EBRD

3. **UNEP FI as Secretariat of the Adaptation and Resilience Investors Collaborative (ARIC) of bilateral DFIs: Adaptation and resilience Impact: A measurement framework for investors,** a practical framework for assessing the positive adaptation impacts of investments, a conceptual approach to embedding adaptation impact assessment in the investment cycle, and a set of aggregable metrics that can be used to support the assessment and management of adaptation impact across investment portfolios.

NEXT STEPS

This guide aims to give teams devloping financial vehicles a blueprint for how to assess and manage their physical climate risks, and to articulate and measure their adaptation impact, where relevant. Note that to comprehensively take the steps outlined above, you will need to dedicate time and resources and conduct external consultations in some cases.

Teams who would like dedicated support can also apply to CPI's early-stage incubation program, the Global Innovation Lab for Climate Finance or later-stage acceleration program, the Catalytic Climate Finance Facility. Vehicles are selected for these programs through an open, competitive process, and interested teams can also access direct support services by engaging CPI in an advisory capacity.

APPENDIXES

TABLE OF CONTENTS

The appendixes provide resources designed to support the goals outlined in this primer. Each includes a brief description of the output, with additional context provided in the main body of the document.

- **Goal 1: Assess and manage your climate risk**
  - **Appendix 1:** Portfolio company-level climate risk exposure spreadsheet template
  - **Appendix 2:** Sample company screening criteria for pipeline development
  - **Appendix 3:** Climate hazard mapping tools
- **Goal 2: Define an adaptation thesis**
  - **Appendix 4:** Template for adaptation narrative frames and examples from past CPI-supported vehicles
- **Goal 3: Design a fit-for-purpose impact measurement and reporting strategy**
  - **Appendix 5:** Theory of change outline
  - **Appendix 6**: EBRD's Green Economy Transition (GET) Framework aggregate indicators

APPENDIX 1: PORTFOLIO COMPANY-LEVEL CLIMATE RISK EXPOSURE SPREADSHEET TEMPLATE

Vehicle managers can use the spreadsheet template below in Excel to assess pipeline-level exposure to climate risks, with one example company filled in for reference. By completing one entry per investee company, they create a portfolio-level analysis of relevant climate risk.

Company Description	Beneficiaries/End-users/ Assets	Geography	Climate Risks Faced	Salience
What do they do?	**List all possible end-users/ beneficiaries as well as relevant assets, infrastructure, or supply chain nodes of your investment pipeline.**	**Where are these beneficiaries/ end-users/ assets?**	**List the climate hazards to which those people/assets/ ecosystem components are exposed in the identified geography**	**Which climate hazards are most material to investment?**
Company A provides climate-smart irrigation systems that secure food production, reduce carbon footprints, and grow household incomes for rural small and medium-scale farmers in Africa. It also provides free agronomy training services to farmers on-site and customized greenhouses and solar dryers. Only 6% of Africa's arable land is irrigated (mainly on large farms). A lack of irrigation significantly hinders agricultural productivity for smallholder farmers.	▪ **Beneficiaries:** Small- and medium-scale farmers, particularly women and youth ▪ **End-Users:** Individual farmers, cooperatives, and agribusinesses using irrigation and post-harvest technologies ▪ **Assets:** Inventory (e.g., solar-powered irrigation systems, water pumps, dam liners and solar dryers) and Company A hub network	Kenya, Tanzania, Uganda	▪ Erratic rainfall and increasing droughts: In East Africa, droughts previously occurred every 5–6 years before 1999, but now happen every 2–3 years. By the end of this century, drought exposure in East Africa could increase by up to 54%, leading to increased crop failure, water scarcity and soil degradation (IPCC, AR6 WGII Chapter 9) ▪ Heat stress: Prolonged heat exposure affects livestock outcomes, agricultural outputs, and general health (ibid) ▪ Flooding: Sub-Saharan Africa has seen a tenfold rise in flood events since the 1970s. The most affected populations are in East and West Africa (ibid). In Kenya, floods in 2018 displaced over 230,000 people, destroyed 8,500 ha of crops, and killed over 20,000 livestock.	**Drought and erratic rainfall are the most material hazards**, as they directly reduce yields and farmer incomes, increasing loan default risk and depressing demand for irrigation equipment. **Heat stress** further suppresses crop productivity and raises water needs, affecting repayment capacity. **Flooding** can damage crops and irrigation assets and disrupt distribution. Together, these hazards can weaken farmer cash flows, raise default rates, and increase operating and maintenance costs for Company A.

APPENDIX 2: SAMPLE COMPANY SCREENING CRITERIA FOR PIPELINE DEVELOPMENT

The table below outlines the sample criteria financial vehicles can use to assess potential portfolio companies' climate risk exposure in the due diligence and technical assistance phase of pipeline development. It also outlines the corresponding operational responses or risk mitigation measures investee companies should incorporate into their business plans to manage such risk.

Sample Criteria	Assessment Requirement	Expected Response
Facility and site locations	Assessment of operational site exposure to physical climate hazards (e.g., floodplains, wildfires, droughts, extreme heat)	Plan for mitigating exposure to identified climate risks (e.g., through siting decisions, physical retrofits, water treatment, or relocation)
Workplace conditions and employee safety	Assessment of worker exposure to relevant hazards (e.g., extreme heat, wildfire smoke)	Plan outlining path to safe working conditions (e.g., cooled workspace, hydration protocols) and contingency plans if thresholds, defined appropriate to the region, are exceeded (i.e., workable temperature cannot be maintained)
Business continuity and disaster recovery	Assessment of operational disruption impact from acute hazards (e.g., cyclones, flooding) and chronic stressors (e.g., heat)	Plan to maintain operations through contingency tools (e.g., power backup, water treatment, duplicated data storage, supplier diversification, insurance)
Community needs and maladaptation assessments	Assessment of how company operations interact with community vulnerabilities (e.g., water scarcity)	Plan to avoid harm and contribute to local climate resilience (e.g., resource efficiency or regeneration)
Governance structures	Assessment of internal capacity to manage and report on climate resilience	Plan detailing roles and responsibilities for risk mitigation and response within the company
Reporting capacity	Assessment of ability to meet funder/investor reporting standards	Plan to strengthen internal data systems and reporting workflows

APPENDIX 3: CLIMATE HAZARD MAPPING TOOLS

The table below outlines a range of resources available for climate hazard mapping. The list is not exhaustive, and some sources may not be regularly updated. Be sure to conduct your own due diligence to ensure you are using accurate and appropriate data.

Name of tool	Geography	Climate hazards	Type of info.	Time horizons	Limitations
World Bank Climate Change Knowledge Portal	Global	Temperature, rainfall, wind, drought risk, heatwave risk	Historic and projections	Up to 2099	Low resolution (100km x 100km)
World Bank ThinkHazard!	Global	1. river ('fluvial') flood; 2. urban flood (comprising river and surface, 'pluvial', flood in urban areas only); 3. coastal flood; 4. tropical cyclone; 5. water scarcity; 6. extreme heat; 7. wildfire; 8. earthquake; 9. landslide; 10. tsunami	Historical trends	n/a	Low resolution (municipal level); No future projections
WRI Aqueduct Water Risk Atlas	Global	Baseline water stress, baseline water depletion, interannual variability, seasonal variability, groundwater table decline, riverine flood risk, coastal flood risk, drought risk, untreated connected wastewater, coastal eutrophication potential, unimproved/no drinking water, unimproved/no sanitation	Projections and historical data	21-year periods centered around 2020, 2030, 2040	Water risks only; Provides hazards; no impact ratings
UCT Climate Information Platform	Africa and Asia	Temperature, drought and rainfall (including extremes)	Projections and historical data	2030 – 2050 2050 – 2070 2070 – 2090	Data station may be geographically distant from the specific site; No information related to vulnerability or exposure.
European Commission INFORM Climate Change Tool	Global	Flood, drought, cyclone, tsunami	Baseline and projections	Baseline (2022), 2050 and 2080	Low resolution
CSIR Green Book	South Africa	Wildfires, flooding, and drought; heat stress	Projections and historical data	2050	South Africa only

APPENDIX 4: TEMPLATE FOR ADAPTATION NARRATIVE FRAMES AND EXAMPLES FROM PAST CPI-SUPPORTED VEHICLES

When formulating an adaptation thesis, begin by identifying the climate hazards that are material to your investment (as in Goal 1), the beneficiaries or systems affected, and how your intervention reduces that vulnerability. Funders may apply different criteria to determine whether an investment is "adaptation-relevant," so the template below is designed to help you begin to articulate the key elements consistently across funders, even if their formats differ.

1. **Climate context & material risks**

   [Target geography] faces significant climate risk, including *[list physical hazards/climate risks identified in Goal 1 – e.g., heat wave, drought, floods, etc.]*. These risks threaten *[describe the people, communities, end-users, and how they are affected – e.g., reduced yields, heat stress, damage to homes]* and/or *[describe the affected business or system functions – e.g., supply chains, infrastructure, production capacity]*.

2. **Define vulnerability**

   These risks increase vulnerability by *[explain why the current system/beneficiaries are exposed – e.g., reliance on rain-fed agriculture, ecosystem degradation]*. As a result, *[summarize the consequences – e.g., reduced income stability, loss of assets, biodiversity loss]*.

3. **Intervention & how it reduces vulnerability**

   By investing in *[target pipeline/market], [vehicle name]* reduces the exposure to the identified climate hazards by *[explain how the financed activities reduce exposure/sensitivity, or strengthen adaptive capacity – e.g., improving access to climate data, enhancing water security, supporting climate-smart agriculture]*.

4. **Outline explicit alignment with funders' adaptation criteria (as relevant)**

Vehicles from the Lab and CC Facility receive support in developing adaptation theses. See sample narrative frames for five of those vehicles below:

Example 1: Climate Resilience and Adaptation Finance & Technology Transfer Facility (CRAFT)

- **Background**: The Lightsmith team developed CRAFT in 2017 as the first commercial investment vehicle to focus on expanding the availability of technologies and solutions for climate adaptation and resilience. CRAFT's 500+ company pipeline includes companies providing business intelligence as well as technology-enabled services that enhance resilience in areas such as supply chain analytics, weather modeling, precision agriculture, water efficiency, distributed energy, business continuity, disaster response, infrastructure engineering, and parametric insurance that will grow faster due to the increased need for adaptation.
- **Climate adaptation relevance:** As CRAFT was building its pipeline after receiving support from the Lab, the Lightsmith team went on to develop its own comprehensive Adaptation Solutions Taxonomy. This tool takes a structured approach to determining whether an SME qualifies as an "Adaptation SME" based on the type(s) of technologies, products, and services offered and the relevant risks they address. The taxonomy outlines a process to evaluate which SMEs may require targeted support to avoid maladaptation and to adopt best environmental and social risk management practices. The framework is also non-prescriptive and broad enough to be used to assess a range of activities across separate geographies. While this has been used to support Lightsmith's portfolio beyond CRAFT's pipeline development, it serves as an example of how organizations focused on adaptation can meaningfully assess their investments and impact.

Example 2: Páramo Wildfire Resilience Facility

- **Background:** In 2024, unprecedented rainfall deficits and wildfires led to Bogotá's first-ever water-rationing policy, affecting over 12 million people. During that period, wildfires destroyed 17,000 hectares of forest in Colombia, including 600 hectares near Bogotá's critical watersheds. With compounded water stress and significant increases in water demand projected in the region by 20501, there is an urgent need to explore innovative approaches to safeguard water security and address the increasing threat of wildfires to watersheds.
- **Climate adaptation relevance:** The Páramo Wildfire Resilience Facility aims to address this urgent challenge by unlocking capital for timely and effective emergency response to catastrophic wildfires, and for the conservation and restoration of páramos. These measures aim to enhance the ecosystem's long-term resilience and safeguard the water security of communities in the Andean region.

Example 3: Catalyst Fund Resilience I

- **Background:** Sub-Saharan Africa faces compounding climate hazards – with droughts now 100 times more likely, temperatures rising 2-4°C by 2050-2100, erratic rainfall, floods, and sea level rise – that threaten climate-sensitive sectors employing over half the workforce. Agriculture faces projected yield declines of 5-17% by 2050, water stress may affect nearly 1 billion people, and inadequate infrastructure amplifies risks for vulnerable populations. With only 12% of required adaptation finance mobilized and private investment comprising less than 9% of climate portfolios, critical gaps persist in early-stage capital for market-driven adaptation solutions, particularly in underserved ecosystems where climate risks are most severe.
- **Climate adaptation relevance:** Catalyst Fund Resilience I reduces vulnerability by mobilizing early-stage equity – supported by blended finance with first-loss protection – into three verticals aligned with national adaptation priorities:
  - Fintech for climate resilience, including insurance and climate data,
  - Sustainable livelihoods, including climate-smart agriculture, land restoration, fisheries, and
  - Climate-smart essential services, including water management, cooling, healthcare, and waste solutions

Combined with venture building and technical assistance, strengthening impact measurement and gender inclusion, these investments enable vulnerable communities to access affordable technologies that enhance adaptive capacity, reduce exposure to droughts, floods, heat stress and water scarcity, and build commercially viable pathways toward climate resilience where public finance has left critical gaps.

Example 4: Cooling as a Service

- **Background:** The Cooling as a Service (CaaS) initiative, led by the Basel Agency for Sustainable Energy (BASE), was supported by the Lab's Sustainable Cities window in 2019, and the team entered the Lab process with a focus on emissions reduction/mitigation. In the process, the team identified significant adaptive co-benefits of improving the energy efficiency of cooling systems and shifting to cleaner refrigerants. In building their adaptation thesis, BASE cited IPCC estimates that global labor

productivity will be reduced during the hottest months to 60% of present productivity by 2100 under the business-as-usual climate scenario.

- **Climate adaptation relevance:** Focusing on the agricultural sector, where the CaaS initiative has seen rising demand for solar-powered decentralized cold rooms, BASE highlighted FAO estimates suggesting that approximately 25% of food waste in underserved markets in developing countries could be eliminated by adopting refrigeration services and equipment equivalent to those available in mature/high-income economies. While these estimates were not context-specific to their implementation geography, they allowed BASE to make the argument that a financing mechanism that reduces upfront costs and barriers to clean cooling would have adaptation benefits for smallholder farmers, agricultural value chains, and commercial building cooling burdens by reducing harvest losses, minimizing food waste, and enabling a more resilient and efficient energy supply.

To support climate adaptation and resilience in the agricultural sector, BASE launched the Your Virtual Cold Chain initiative to scale CaaS for smallholder farmers. The project integrates a data-driven mobile application called Coldtivate, which allows farmers to track the shelf life of their produce and make informed decisions on when and where to sell, reducing distress sales. The app is a key component in enhancing the value of refrigeration for smallholder farmers and making cold chain services more sustainable.

Example 5: Climate Investor Two

- **Background:** Climate Fund Managers, the fund management team behind Climate Investor Two, were supported by the Lab in 2015 as they worked to develop a prior fund—Climate Investor One. With Climate Investor Two, Climate Fund Managers found that working with public financial institutions necessitated a sophisticated articulation of the fund's adaptation thesis.
- **Climate adaptation relevance:** Climate Investor Two is a fund that supports the private sector in developing and constructing climate-resilient infrastructure projects in developing countries in the water, sanitation, and ocean sectors—areas that do not usually attract private sector interest. The targeted investments under the fund aim to reduce the effects and consequences of climate change by decreasing greenhouse gas emissions and increasing the resilience of vulnerable communities. For instance, in the water sector, Climate Investor Two helps countries undergoing, or expected to undergo, water stress to adapt to climate change by building infrastructure that sources, transports, and treats the water necessary for both municipal and industrial users.

APPENDIX 5: THEORY OF CHANGE OUTLINE

The table below outlines the key elements of a Theory of Change and offers a potential visualization approach to illustrate connections and causal pathways between activities and impact.

Instrument Theory of Change	
GOAL	The single core goal of the instrument should be the 1-2 sentence overarching objective derived from the 2-3 impact objectives.
IMPACT	This is your opportunity to describe the overarching mission of the instrument at the level of 2-3 key impacts. The impact is not necessarily directly measurable or attributable, but has a clear connection to the outcomes, outputs, and activities of the instrument.
OUTCOMES	Outline the 3-5 outcomes you hope to deliver from the activities of the approach, at the level of outcomes that are out of the direct control of the project but still influenced by and specific to the project type and measured at longer timeframes.
OUTPUTS	Describe the direct 4-8 outputs of the activities executed and/or of the pipeline described under activities. Outputs can be directly linked to the activities below - i.e., activity 1 -> output 1, or more generally linked to the set of activities. Outputs are typically directly within the control of the project/activity.
ACTIVITIES	Capture the core set of 4-8 direct activities the instrument plans to execute—this could include pipeline development, data gathering, key financial flows, due diligence, etc., akin to the GAHF example. An alternative approach here would be to capture the type of pipeline the instrument plans to target, akin to the CCRF example.

APPENDIX 6: EBRD'S GREEN ECONOMY TRANSITION (GET) FRAMEWORK AGGREGATE INDICATORS

The following table outlines a list of potentially useful high-level aggregate indicators for adaptation outcomes. Other, more granular, sector-specific indicators can be found in green taxonomies to support impact measurement frameworks.

Increased water availability	Additional water made available as a result of the project, either through water savings or through the provision of additional usable water	m^3/year
Increased energy availability	Additional energy made available as a result of the project, either through energy savings or through increased energy generation	MWh/yr
Increased agricultural potential	Additional capacity for agricultural potential was achieved as a result of the project through improvements in soil quality	Tons yield/yr
Increased human health/productivity	Improvements in human productivity due to improved health and wellbeing as a result of the project	QALYs/yr
Reduced weather-related disruption	Reduction in the amount of time that a system or elements of a system are rendered inoperable (in other words, lost operational expenditure) due to acute climate risks	Days/yr
Reduced weather-related damage	Reduction in the damage to assets (or lost capital expenditure) due to acute climate risks, such as more frequent extreme weather events or chronic climate risks	Risk frequency/ service life