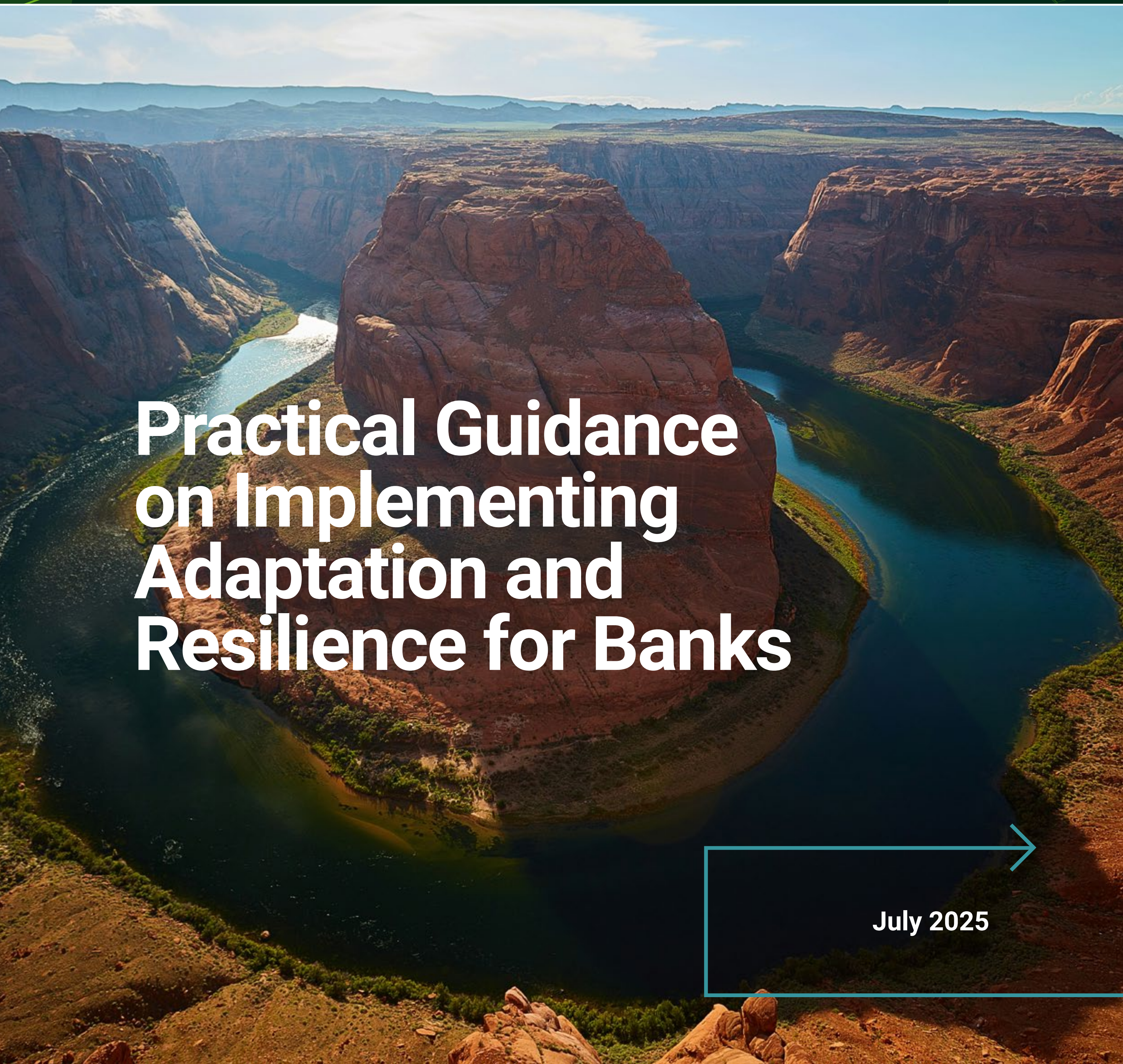
Principles for Responsible Banking: Guidance for banks

UN environment programme | finance initiative

Principles for **Responsible Banking**



Practical Guidance on Implementing Adaptation and Resilience for Banks

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This guidance represents examples and recommendations for potential approaches to climate resilience by banks and other credit institutions. It is not prescriptive as to actions or decisions to be taken by members, including when and how they may address physical climate risks. Members of the Principles for Responsible Banking (PRB) set and design their own individual targets, strategies, and policies, making their own unilateral decisions guided by their business activities and country context. The choice to adopt any available guidance, best practice tools or actions is always at the discretion of individual members of the PRB. Any references to external frameworks or organizations should not be considered an endorsement of that organization or their work. Your organization should be aware of the rapidly evolving legal and regulatory landscape concerning climate change, including potential litigation risks related to climate risk disclosures, financed emissions, and the impacts of financed projects (including adaptation measures), and should seek independent legal counsel as appropriate.

This guidance is intended to support your organization and does not create new obligations. Neither this guidance nor the PRB itself seeks to interfere with members' obligations to comply with their regulatory and/or supervisory requirements. The content of this guidance document does not constitute legal or financial advice to members of the PRB. Further, any views expressed in this guidance do not necessarily represent the views of each individual member, including those in the relevant working group (WG) and expert review group that assisted in the preparation of the guidance. Participation in the WG by any individual member should neither be interpreted as a commitment to set climate adaptation-related targets, nor should it be construed as form of collective action.

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This Guidance is based on discussions and work undertaken in the Principles for Responsible Banking (PRB) Climate Adaptation Working Group, which, following increasing interest in the topic, was tasked with supporting the development of guidance to help banks and other credit institutions set credible adaptation targets and to help build knowledge and awareness of the associated risks and opportunities for private finance more generally.

Abbreviations and acronyms

A&R	Adaptation and Resilience
IPCC AR6 WGII	Working Group II (Impacts, Adaptation and Vulnerability) contribution under the IPCC 6th Assessment Report
CRE	Commercial Real Estate
DFIs	Development Finance Institutions
DNSH	Do No Significant Harm
ExCo	Executive Committee
IFRS	International Financial Reporting Standards
IPCC	Intergovernmental Panel on Climate Change
IRR	Internal Rate of Return
KPI(s)	Key Performance Indicator(s)
LTV	Loan-to-Value ratio
MDBs	Multilateral Development Banks
NAPs	National Adaptation Plan(s)
NbS	Nature-based Solutions
NDCs	Nationally Determined Contributions
NPLs	Non-Performing Loans
PCRA	Physical Climate Risk Assessment
PRB	Principles for Responsible Banking
RM	Relationship Manager
RRE	Residential Real Estate
TCFD	Task Force on Climate-Related Financial Disclosures
TPT	Transition Plan Taskforce (UK)

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Glossary

These definitions explain key terms used in this guidance. Climate terms are based on the IPCC AR6 WGII Glossary, with added context for banking. Banking terms explain specific financial concepts relevant to A&R. Bank functions are illustrative, defined here to ensure common understanding.

a. Climate terminology

Climate adaptation: In human systems, this means adjusting to the actual or expected effects of climate change to reduce harm or take advantage of new opportunities. In natural systems, it's the process of adjusting to climate change; humans can help natural systems adapt. For banks, climate adaptation involves adjusting strategies, operations, and financing activities to manage the risks and seize opportunities arising from climate change impacts.

Climate resilience: This is the ability of communities, economies, and ecosystems to cope with climate hazards or disturbances. It involves responding or reorganizing in ways that maintain their essential function, identity, and structure, while also allowing for adaptation and learning. For banks and their clients, resilience means the ability to anticipate, absorb, manage, or recover from climate impacts efficiently. This includes protecting and restoring vital structures and functions.

Equitable resilience: Resilience that is able to support the development of social-ecological systems that are contextually rooted, responsive to change and socially just, and thus relevant to global sustainability challenges (Matin *et al.,* 2018).

Physical climate risk: These are risks resulting from the physical impacts of climate change. They include:

- **Acute risks:** Event-driven hazards like floods, storms, or wildfires.
- **Chronic risks:** Longer-term shifts like rising sea levels, changing rainfall patterns, or increasing average temperatures.

Physical climate risks can impact a bank directly (e.g., damage to its branches) or indirectly through its clients and investments (e.g., damage to collateral, supply chain disruptions, lower client profits). Physical climate risk is typically understood as a function of Hazard, Exposure, and Vulnerability (see Figure 4 and Section 1.2).

Adaptive capacity: This refers to the ability of systems, institutions, and individuals to adjust to potential climate damage, take advantage of opportunities, or respond to consequences. In a banking context, it often refers to a client's ability (or the bank's own ability) to implement adaptation measures effectively to manage physical climate risks.

Maladaptation: These are actions intended to help adapt to climate change that unintentionally increase the risk of adverse climate-related outcomes. Maladaptive actions might increase vulnerability to climate change, reduce resilience, or have negative consequences for other systems or groups (e.g., building a seawall that protects one area but increases flood risk elsewhere). Banks should aim to avoid financing maladaptation, for example by considering principles to prevent significant negative unintended consequences such as Do No Significant Harm (DNSH) when evaluating projects.

Co-benefits: Additional positive outcomes beyond the primary adaptation objective that results from an A&R measure (e.g., improved energy efficiency, enhanced biodiversity, job creation).

Blended finance: The strategic use of development finance (e.g., from DFIs or public funds) alongside commercial finance to de-risk investments and mobilize private capital for projects with high development impact, including A&R.

b. Banking terminology

Banks and credit institutions: This guidance has been designed to support a range of banks and wider credit institutions e.g., building societies, in engaging on A&R. Where a bank is referred to in this document it is intended that the guidance extends, and equally applies, to wider credit institutions.

Credit risk: The risk of financial loss if a borrower or counterparty fails to meet their contractual obligations. Climate change can increase credit risk through physical impacts on a borrower's assets (collateral) or their ability to repay, and also through transition risks.

Internal Rate of Return (IRR): A standard financial metric used to estimate the expected annualized rate of return of an investment. It helps evaluate the profitability and financial viability of potential projects, including adaptation projects, by calculating the discount rate at which the net present value of cash flows is zero.

Loan-to-Value (LTV) Ratio: A ratio comparing the amount of a loan to the assessed value of the asset being financed (e.g., a property). Physical climate risks can reduce asset values, which affects LTV ratios and the associated credit risk for the lender.

Non-Performing Loans (NPLs): Loans where the borrower has failed to make scheduled interest or principal payments for a specified period. Climate change impacts can increase the likelihood of loan defaults, potentially leading to higher NPL levels for banks.

Value at Risk (VaR): A statistical measure estimating the potential loss in value of an asset or portfolio over a specific period, within a given confidence level. VaR models can potentially be adapted to incorporate climate risk factors.

c. Bank functions, defined in terms of A&R involvement

Business lines: Client-facing functions responsible for managing relationships (often via Relationship Managers—RMs), originating loans and other financial products/services, implementing the A&R strategy directly with clients, and gathering client-specific information. Represents the first line in managing client-level A&R risk and delivering adaptation finance solutions.

Data, analytics and technology (IT): Manages the data infrastructure, governance, quality control, and systems required for A&R. Provides analytical capabilities (including data science expertise) and technology platforms to support PCRA, monitoring, and reporting.

Finance: Manages the bank's financial resources and planning in relation to A&R. Responsible for budgeting, tracking A&R-related financial performance and KPIs, assessing capital implications, and often handles Investor Relations communications on A&R.

Policy and external relations: Monitors the external policy, legislative, and regulatory environment relevant to A&R. Manages relationships with policymakers, regulators, and industry associations on A&R topics, and leads or coordinates related advocacy efforts.

Product development: Designs, develops, launches, and manages specific financial products and services tailored to meet A&R needs and opportunities, ensuring alignment with strategy, risk appetite, relevant standards, and collaborating with business lines, risk management, and finance functions.

Risk management: Owns the A&R risk management framework, including the development and execution of Physical Climate Risk Assessments (PCRA). Defines A&R risk appetite, integrates climate considerations into existing risk frameworks (e.g., credit, operational), provides second-line oversight, and oversees A&R-related risk modelling.

Sustainability and strategy: Drives the overall A&R strategic direction, integrating it with broader sustainability goals and business strategy. Provides A&R subject matter expertise, coordinates cross-functional initiatives, often defines non-financial targets/KPIs, fosters A&R culture, and oversees sustainability reporting.

Key takeaways

With climate impacts intensifying there is a growing urgency for adaptation and resilience (A&R) solutions, the financing for these solutions, and the need for banks to strengthen their own resilience, across their operations and portfolios. This guidance provides banking professionals with a practical resource to engage on A&R. Consider these six primary takeaways as strategic imperatives for managing risk and unlocking A&R opportunities:

1. **A&R is contextual—design for your needs**
   A&R is not one-size-fits-all. Proactively assess your specific operating and business environment, including policy, market dynamics, sector vulnerabilities, and geographic risk, to inform a targeted and effective A&R approach.

2. **Effective A&R action requires targeted integration**
   Effective A&R action involves more than standalone initiatives. Aim to embed A&R considerations and actions deeply within your bank's core strategies, governance, policies, and processes, while ensuring alignment with climate mitigation, nature and social actions plans.

3. **Resilient portfolios and A&R product innovation**
   Address A&R through strategic portfolio management and innovative product design. This dual approach helps customers build resilience and unlocks financing opportunities in the A&R technologies, products, and/or services that benefit people, businesses, and nature.

4. **Engage with clients**
   Make client engagement central to your A&R strategy. Understanding client needs and providing tailored A&R services and products builds client resilience and creates mutual value.

5. **Support and advocate for systemic resilience**
   Recognize the bank's unique position to not only finance, but also advocate for broader systemic resilience (e.g., resilient infrastructure). Incorporate this wider perspective into your A&R strategy to amplify your impact and support long-term client resilience.

6. **Adopt a progressive approach**
   Integrating A&R may appear to be a complex task, but can be tackled in stages as the bank's capacity evolves and access to data and tools expands. Begin with practical, incremental steps, foster a culture of continuous improvement, and iteratively refine your A&R capabilities, products, and services as the landscape evolves.

Moving beyond risk management to active engagement on adaptation and resilience is not just desirable, it is essential to manage risks, while adaptation and resilience-oriented technologies, services and resilient investments, may represent a USD 9 trillion market by 2050.[1]

1 GIC (2025), Sizing the Inevitable Investment Opportunity: Climate Adaptation. Available at: gic.com.sg/uploads/2025/05/Sizing-The-Climate-Adaptation-Opportunity_GIC_Final.pdf

Executive summary

2024 was the warmest year on record globally, with temperatures exceeding 1.5°C above pre-industrial levels for the first time.[2] Global temperatures will continue to rise over the coming decade with escalating impacts from extreme weather events, floods, landslides, wildfires and droughts, alongside chronic climate impacts like rising sea levels.[3] This reality is driving greater demand for adaptation and resilience (A&R) solutions across the real economy. Banks increasingly recognize the importance of strengthening their own resilience and demonstrating this to the market. Banks are uniquely positioned to support customers in becoming more resilient and to finance the technologies, products, and services that enable people, businesses and nature to become more climate resilient. This guidance provides a structured framework and practical considerations to help banks achieve these outcomes.

This guidance applies the UN Principles for Responsible Banking Journey to show how banks might approach the A&R imperative. It structures practical advice around three interconnected cornerstones: **Assessment**, **Strategy**, and **Action**.

Assessment
Qualifying and quantifying climate risk materiality and the adaptation and resilience opportunity.

Strategy
Defining the bank strategy to manage physical climate risk and to pursue the adaptation and resilience opportunity.

Action
Implementing the adaptation and resilience strategy through client engagement, policies, processes and effective governance.

Figure 1: The Responsible Banking Journey (2025) and its application in adaptation implementation

2 Copernicus Climate Change Service, Copernicus: 2024 is the first year to exceed 1.5°C above pre-industrial level, 10 January 2025. Available at : climate.copernicus.eu/copernicus-2024-first-year-exceed-15degc-above-pre-industrial-level

3 UN Environment Programme, Adaptation Gap Report 2024

Assessment

Recognizing that A&R is contextual, with appropriate solutions varying by financing needs, sector, market and geography, the **Assessment** cornerstone focuses on identifying relevant risks and opportunities for banks. Dimensions for banks to consider include:

The public policy environment, market dynamics and sector sensitivity

Considering the policy environment in their operating markets can help banks align their objectives with public policy such as National Adaptation Plans (NAPs), potentially achieving mutually beneficial outcomes for all A&R stakeholders. Beyond specific policies, understanding broader market trends and inherent vulnerabilities of different sectors can be an important way of informing a bank's physical climate risk assessment, and subsequent A&R strategy.

Physical climate risk

Banks may choose to leverage industry-recognized physical climate risk tools and climate scenarios to assess the materiality of physical climate risk across portfolios and individual clients. A clear understanding of the physical climate risk context can enable banks to connect risk with opportunity and develop a meaningful A&R strategy.

Monitoring progress and performance

A&R is dynamic, continuously evolving with market conditions and emerging solutions. Being responsive to this dynamic context is important, particularly given rapidly changing climate impacts and limitations of scenario analysis. Effective monitoring structures and feedback mechanisms can help ensure that the underlying logic and data supporting A&R strategy remains valid and can enable continuous improvements to portfolio and product strategies over time, as appropriate.

Strategy

The **Strategy** cornerstone focuses on defining a clear direction for A&R that aligns with the bank's overall commercial objectives. This can involve developing portfolio and product-specific A&R approaches, supported by effective governance, clear accountability and oversight, defined roles and responsibilities, and meaningful targets.

Portfolio-based and product-based strategy

Banks may define strategies to manage physical climate risk within existing portfolios while also proactively seeking opportunities to finance A&R solutions and practices. Examples could include assigning higher LTVs to adaptation-linked assets or revising lending criteria for portfolios. Effective portfolio strategies can support banks in being flexible and adaptive to emerging client needs while managing overall portfolio risk according to pre-defined criteria. These approaches may further inform specific product-based strategies such as sustainability-linked loans or use-of-proceeds instruments.

Systemic resilience

Recognizing that individual bank or client action often has systemic dependencies in achieving resilience (e.g. reliance on public infrastructure such as the road network), a bank may consider developing a wider systemic resilience strategy. This could involve directly financing resilient infrastructure and/or engaging with policymakers to advocate for wider systemic resilience.

Governance

An effective A&R strategy should be supported by clear accountability and oversight of its implementation. This includes defining roles and responsibilities across the bank and establishing targets to monitor and evaluate progress.

Action

The **Action** cornerstone details how banks can translate A&R strategy into practice. This includes enhancing internal structures and practices, alongside effectively engaging clients and wider partners. Banks can consider the following factors in their implementation journey.

Operating model

Embedding A&R considerations into bank policies and core processes, supported by relevant capacity building, can ensure effective integration in a bank's operating model. This integrated approach can be strengthened by dedicated A&R data management to support the availability and accuracy of the data underpinning the A&R strategy.

Implementing portfolio and product strategy

Qualifying and quantifying the A&R financing opportunities can involve evaluating demand for specific A&R solutions, assessing financing viability (including client ability to replay, asset value and expected return) and comparing the 'cost of inaction' with the benefits (including co-benefits) of A&R. Banks may also consider structured finance options for identified A&R opportunities, especially for emerging markets or higher-risk projects.

Client engagement

Banks may consider two engagement pathways when engaging clients around A&R: a bank-led approach whereby banks reach out to clients and engage them on A&R topics like identified physical climate risk, and a client-led approach, where clients seek a bank's support for their A&R needs. Having defined approaches for these pathways can support strategy implementation and enhance a bank's product and service offerings for clients.

Reporting and disclosures

Banks must be mindful of their regulatory environment and comply with all relevant regulatory and legal reporting requirements around A&R (including physical climate risk materiality). Many banks find it useful to reference the IFRS S2 framework for reporting, among others with other frameworks also available for bank utilization. The general trend in bank reporting is towards integrated reporting of A&R within wider climate/transition disclosures. While full comparability of A&R disclosures is complex due to its contextual nature, aligning with recognized industry frameworks is a step towards enabling more meaningful comparison of bank performance by stakeholders.

Continuous improvement

A commitment to continuous improvement can help ensure a bank's A&R strategy remains effective over time. This involves regularly reviewing approaches to manage risk, capture new resilience opportunities, and fostering innovation in A&R products, services, and engagement.

This guidance aims to equips banks and practitioners with a more complete understanding of A&R. The full document offers further detail around how banks can consider taking practical implementation steps to manage risk, unlock new opportunities and build the resilience of themselves, their clients, and the wider economy.

Introduction and how to use this guidance

Guidance background and objectives

This *Practical Guidance on Implementing Adaptation and Resilience for Banks* has been developed by the PRB Adaptation working group, building upon the four-step framework to set adaptation targets and develop related action plans established in the PRB Climate Adaptation Target Setting Guidance (UNEP FI, 2023). This guidance has been designed to be a practical and actionable resource for banking professionals navigating the complexities of A&R. Whether your bank is just beginning its A&R journey or looking to enhance established practices, this paper provides a roadmap and resources to support bank action.

Guiding principles

Central to this guidance are two framing principles:

i. fostering positive impact, and
ii. avoiding negative outcomes.

Effective A&R initiatives should extend beyond risk mitigation to contribute to broader societal resilience and sustainable development goals. It is important that A&R actions themselves do not lead to maladaptation—inadvertently increasing climate vulnerability—or cause other significant negative unintended consequences. Integrating these considerations ensures that A&R efforts are beneficial to all stakeholders and helps banks contribute meaningfully to global resilience goals. Adopting principles such as 'Do No Significant Harm' (DNSH) can support banks in addressing maladaptation risk.

Illustrative levels explained

This guidance also recognizes that every bank's A&R journey is unique, shaped by its starting point, resources, and strategic focus. Therefore, instead of a one-size-fits-all mandate, a progressive approach has been designed to support banks in identifying practical actions relevant to their current abilities and needs as they implement A&R strategy. Within each section of the guidance a summary box outlines examples of actions and capabilities corresponding to three illustrative levels of practice: Getting started, Responsible practice and Leading practice. The levels aim to demonstrate different points on a developmental journey, helping banks chart a course relevant to their own unique context, resources, and strategic focus. These are not intended as formal ratings, rankings, or prescribed linear paths that all banks must follow.

Getting started. This illustrative level focuses on foundational steps for those banks beginning their responsible banking actions related to A&R, such as building awareness, initial risk exploration using available data, identifying major strategic gaps, and formulating basic policies or processes. Banks may also adopt a prioritized approach, identifying focus areas for initial action based on limited resources.

Responsible practice. This level describes the integration of A&R into regular operations, for example conducting more detailed risk assessments, enhancing data quality, engaging clients systematically, setting clear targets, developing an adaptation plan and establishing more formal A&R governance structures. This level aims to guide those banks who are aiming to progress beyond the early, foundational A&R steps as part of their responsible banking action plan.

Leading practice. This level outlines advanced integration, A&R-related action and market leadership, for example employing sophisticated analytics, using scenario analysis, fostering systemic resilience through partnerships, measuring impact, and contributing to market development. This level identifies ambitious, often cutting-edge practices which serve to inspire and inform wider market action.

Sector prioritization

While the principles in this guidance are broadly applicable, effective A&R action often requires tailoring to specific economic sectors. To provide concrete illustrations and ground the concepts in practical contexts, the working group that informed this guidance focused its efforts on two sectors generally recognized as having significant exposure to climate-related impacts:

- **Real estate** (covering both Commercial Real Estate (CRE) and Residential Real Estate (RRE))
- **Agriculture and food**

These sectors were chosen for their climate exposure, the potential for better data access (especially real estate), and emerging adaptation solutions that may offer viable financing opportunities. Although many examples and detailed scenarios (particularly in the Annexes) draw from these sectors, banks operating in other areas should focus on applying the core methodologies in this guidance and adapting the principles to their own unique portfolios and client needs.

Guidance structure

This guidance follows the UN Principles for Responsible Banking Journey, defining the key areas of A&R implementation based around three cornerstones—**Assessment**, **Strategy**, and **Action** (see Figure 2). Recognising that each bank engages with A&R differently, the framework is designed to be flexible, allowing banks to engage in activities based on their contexts and needs, and supporting continuous learning and improvement (detailed in Section 4) as banks evolve their A&R capabilities.

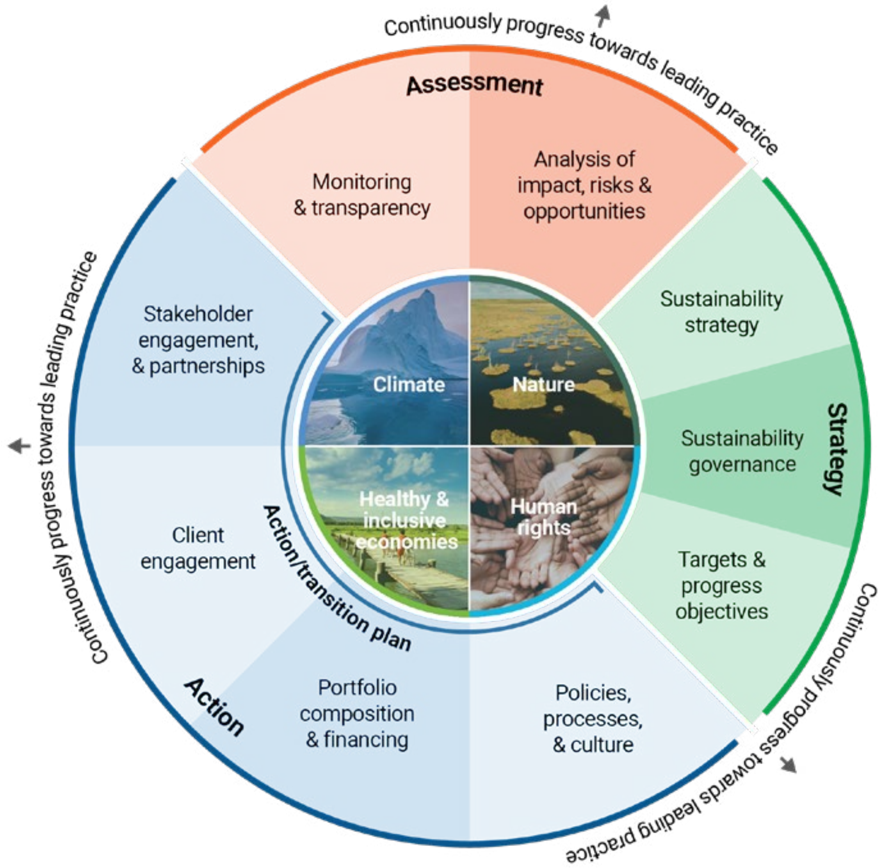


Figure 2: Responsible Banking Journey (2025)

Assessment

Objective	Key questions addressed
Qualifying and quantifying physical climate risk materiality and the A&R opportunity.	▪ **Analysing your external context (Section 1.1):** How can your bank understand evolving policy, market dynamics, and sector-specific vulnerabilities to anticipate A&R drivers and needs? ▪ **Assessing your portfolio's physical climate risk (Section 1.2):** What approaches can your bank use to evaluate exposure and vulnerability to climate hazards, from initial screening to detailed assessments? ▪ **Establishing effective monitoring (Section 1.3):** How can your bank track A&R progress, performance, and the changing risk landscape to ensure your approach remains relevant?

Strategy

Objective	Key questions addressed
Defining the bank strategy to manage physical climate risk and to pursue the A&R opportunity	▪ **Define your A&R strategic priorities (Section 2.1):** How can your bank translate assessment insights into clear objectives, articulate its risk appetite for physical climate risks, and balance risk mitigation with A&R financing opportunities? ▪ **Establish robust A&R governance (Section 2.2):** What governance structures, roles, and responsibilities are needed to oversee the A&R strategy, ensure accountability, and integrate A&R into decision-making (detailed in Section 2.2)? ▪ **Set meaningful A&R targets (Section 2.3):** How can your bank develop clear, well-defined targets that translate strategic ambition into measurable action and drive progress?

Action

Objective	Key questions addressed
Implementing the A&R strategy through client engagement, policies, processes, and effective governance.	▪ **Shaping your portfolio composition and financing (Section 3.1)**: How can your bank identify and develop viable A&R finance opportunities and products, adapting existing offerings or creating new ones to support client resilience? ▪ **Driving effective client engagement on A&R (Section 3.2)**: What approaches can your bank use to partner with clients, understand their A&R needs, support their adaptation planning, and provide appropriate solutions? ▪ **Building strong internal foundations for A&R (Section 3.3)**: What internal policies, processes (including data management and disclosures), and cultural enablers (e.g., staff capacity) need to be enhanced to support effective A&R implementation? ▪ **Ensuring transparent communication (Section 3.4)**: How can your bank approach external A&R disclosures and enhance stakeholder transparency ▪ **Understanding the interplay with the insurance sector (Section 3.5)**: How do insurance market dynamics affect A&R risks and opportunities for your bank and its clients?

Continuous learning and feedback

Objective	Key questions addressed
Ensuring the bank's A&R approach remains effective, responsive, and continuously evolves by learning from experience and new insights.	▪ **Learning from A&R Implementation (Section 4):** How do monitoring insights and operational experience from Assessment, Strategy, and Action feed back to refine each of these cornerstones and the overall A&R approach? ▪ **Establishing feedback loops (Section 4):** What processes and internal cultural elements can ensure that learning is captured and used to make the bank's A&R efforts more effective and relevant over time?

Connecting the PRB Adaptation Target-Setting Guidance

This guidance builds directly on the 2023 Guidance, providing practical insights into implementing the four-step framework for banks. The four steps map onto the implementation cornerstones as follows:

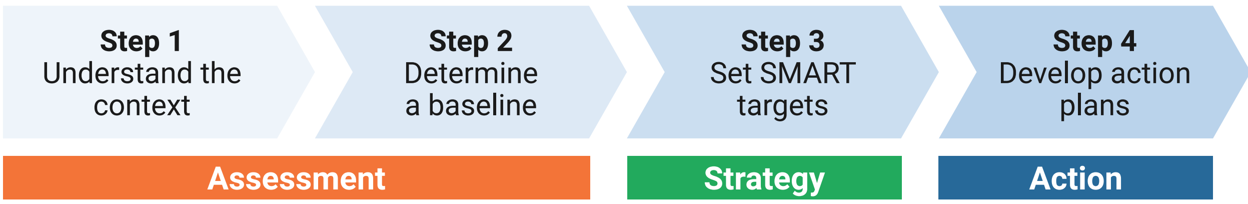


Figure 3: The four steps of the PRB Climate Adaptation Target-Setting Guidance, mapped to the PRB implementation cornerstones

→ Step 1 (Understand Context) and Step 2 (Determine Baseline) are foundational steps, which are core activities within the Assessment cornerstone described in this guidance (Section 1).

→ Step 3 (Set SMART Targets) is a key component of defining the bank's direction and ambition, falling within the Strategy cornerstone (Section 2, specifically 2.3).

→ Step 4 (Develop Action Plans) is central to the Action cornerstone (Section 3), which details the practical implementation activities.

It is important to note that this Implementation Guidance emphasizes a continuous incremental process in line with the Responsible Banking Journey, so the four-step framework should be seen as such rather than a linear journey.

Role of the annexes

To support practical application, the Annexes (starting page 59) provide supplementary details, resources, and illustrative worked examples referenced throughout this guidance. These Annexes are structured as follows:

- Annex A offers in-depth explanations of **selected public policy examples** and their implications for banks' A&R efforts.
- Annex B provides more specific **context and business case considerations** for A&R in the Real Estate and Agriculture sectors.
- Annex C contains detailed, illustrative scenarios showing how banks might approach various **A&R activities** in practice.
- Annex D lists **relevant external frameworks, tools, methodologies, and standards** that can support banks in engaging in A&R.

1. Assessment

This Assessment cornerstone focuses on building the contextual understanding necessary for effective A&R implementation. This section details the core analytical activities banks undertake, covering the analysis of the external context (policy, market, sector insights) (1.1), the execution of physical climate risk assessments (PCRA) (Section 1.2), and the establishment of frameworks for monitoring progress and performance (Section 1.3).

The insights and baselines generated through Assessment (Section 1) activities are inputs for defining the bank's Strategy (Section 2) and guiding subsequent Actions (Section 3).

1.1 Analysing the external context: policy, market and sector insights

Understanding the external environment is important for identifying A&R-related risks and the corresponding opportunities to finance adaptation solutions. This involves analysing public policy directions, market dynamics and demands, and sector-specific vulnerabilities. This analysis is not static; ongoing monitoring (Section 1.3) should inform updates to this external context understanding.

1.1.1 The public policy landscape

Government policies shape the A&R environment. Understanding and aligning with these policies is foundational for an effective A&R approach, as they often define national priorities, signal investment needs, and can influence market dynamics. Analysing policy signals can allow banks to:

- Understand how policy action (or inaction) influences the physical climate risks clients face and the resulting risks within the bank's portfolio. Policy analysis can also help identify related client needs and business opportunities.
- Recognize priority areas for investment and innovation signalled by policy, creating potential markets for A&R finance that banks can align product development around.
- Have more informed and relevant conversations with clients about risks, regulations, available support, and financing options.
- Ensure the bank's A&R strategy aligns with national or regional priorities and evolving regulatory expectations.

Identifying and leveraging public policy, strategy and planning

Potential entry points for policy engagement are set out below, summarized in Table 1, with brief illustrative examples of bank actions for real estate and agriculture provided in Annex A.

- **National Adaptation Plans (NAPs)** and Nationally Determined Contributions (NDCs) are the primary policy documents under the UN Framework Convention on Climate Change (UNFCCC) and the Paris Agreement. While NDCs frame overall climate commitments (including adaptation goals), NAPs focus specifically on identifying medium- and long-term adaptation needs and developing strategies to address them. NAPs highlight vulnerable sectors and regions, and potential investment needs, helping banks to identify risks and opportunities (e.g., understanding vulnerability contexts like in the Kenya NAP (Annex A.1) or identifying innovation needs like in the Vietnam NAP (Annex A.2)). NDCs frame overall climate commitments. Comprehensive NAPs may also identify key sectoral interdependencies relevant to bank portfolios. While some NAPs have engaged the private sector in their development, more work is required to connect financial actors during the implementation phase to ensure NAPs are as effective and actionable as possible. UNEP FI and PRB are actively working to support increased public and private sector collaboration around this topic.
- **Sub-national and Sectoral Plans** often provide more granular detail on risks, specific actions, and infrastructure projects relevant to specific client operations (e.g., providing granular local risk data and action plans like the New York City Stormwater Plan (Annex A.5), which highlights crucial interdependencies between infrastructure systems like water, energy, and transport).
- **Collaborative platforms and guidance** shape market expectations and foster common approaches. Examples include national or sector-level collaborative dialogues that bring together diverse stakeholders (e.g., the Dutch Central Bank's Sustainable Finance Platform (Annex A.4)) and specific jurisdictional guidance on adaptation planning. Regulatory statements, disclosure standards (e.g., IFRS S2), taxonomies, and integrated transition frameworks are also key signals, and are examined further in relevant sections of this guidance (e.g., Section 3.3.5).
- **Private Sector Engagement Strategies:** Specific policy components, particularly within NAPs, may explicitly outline roles, barriers, and engagement mechanisms for private finance (e.g., identifying financing needs and mechanisms as in the Bangladesh NAP (Annex A.3)).
- **Maladaptation and related principles:** Across these policy signals, the increasing relevance of principles to avoid significant harm and prevent maladaptation should be considered, ensuring adaptation finance aligns with broader environmental objectives and evolving market expectations.

Table 1: Leveraging public policy information for A&R strategy and analysis

Information source	Key information to look for	How to use and shape it
National		
National Adaptation Plans (NAPs)	▪ National A&R priorities ▪ Vulnerabilities ▪ Planned measures ▪ Potential private sector role and finance needs	**Use:** Inform strategy; input to PCRA; identify potential financing opportunities. **Engage:** Provide feedback during NAP reviews on financing gaps, private sector barriers, and practical implementation challenges; advocate for clearer private sector roles and enabling investment conditions.
Nationally Determined Contributions (NDCs)	▪ Adaptation components ▪ National climate commitments	**Use:** Inform A&R Strategy; basis for stakeholder dialogue. **Engage:** During NDC updates, advocate for stronger adaptation components and clear links to financing needs.
Central bank/ regulator statements and guidance	▪ Supervisory expectations ▪ Guidance on climate risk disclosures, scenario analysis, risk management	**Use:** Ensure internal processes meet expectations; inform governance structure; guide reporting practices; define minimum requirements for risk management. **Engage:** Respond to consultations on climate risk guidance; provide structured feedback on implementation experiences and challenges; contribute to discussions on effective supervision for A&R.
Sub-national and sector		
State/provincial/ city adaptation plans	▪ Granular local risks and priorities ▪ Specific projects ▪ Land-use planning regulations	**Use:** Refine PCRA for specific locations; inform client dialogue about local context. **Engage:** Engage with local authorities on financing local adaptation projects; provide feedback based on observed local client needs.
Sector-specific adaptation plans (e.g., agriculture)	▪ Detailed sector risks and required measures ▪ Technology needs ▪ Sector standards or incentives	**Use:** Inform sector-specific A&R strategy; guide product development; build internal expertise. **Engage:** Provide input to planning bodies on the ability to finance proposed measures; suggest innovative financing mechanisms tailored to the sector.
Industry association positions/ initiatives	▪ Best practices within the sector ▪ Common challenges faced by peers ▪ Advocacy points ▪ Collaborative projects.	**Use:** Understand client perspectives; benchmark bank performance against peers. **Engage:** Collaborate within associations on A&R policy positions; jointly advocate for supportive regulations; share best practices for financing A&R within the sector.

Information source	Key information to look for	How to use and shape it
Taxonomy/ indicator frame-works (govt. or industry)	▪ Definitions of A&R activities ▪ Eligibility criteria for sustainable finance labels ▪ Standardized metrics.	**Use:** Help banks to identify eligible activ-ities for A&R opportunities in a rapidly growing market; ensure A&R products align with recognized definitions and criteria; standardize monitoring and reporting. **Engage:** Participate in consultations on taxonomy/framework development to ensure practicality, usability, and effec-tiveness in channelling finance towards genuine A&R impact.

1.1.2 Understanding market dynamics and sector vulnerabilities

Beyond specific policies, understanding broader market trends and the inherent vulnerabilities of different sectors helps inform a bank's A&R strategy and risk assessment. This requires ongoing market intelligence gathering, with responsibilities sitting across different bank functions depending on operating model and context. For example, identifying trends in regional real estate markets should be the responsibility of the relevant team at the regional level, not necessarily the head office.

To track market and client dynamics, banks may monitor:

- **Client needs:** Client feedback, inquiries, and stated needs related to managing climate risks or implementing A&R measures.
- **Emerging solutions:** Emerging A&R technologies, materials, and services (e.g., advanced irrigation, climate-resilient construction materials, parametric insurance triggers, early warning systems). Track patent trends and venture capital investment in A&R-related startups. Reference relevant sustainable finance taxonomies or A&R technology catalogues.
- **Peer activities:** Analyse A&R-related products, services, targets, and strategies being launched by competing financial institutions.
- **Development Finance Institutions (DFIs):** Track the priorities, financing windows, and relevant programs of Development Finance Institutions and Public Development Banks active in the bank's markets/sectors.
- **Insurance market signals:** Trends in insurance pricing, coverage availability, and potential market withdrawals in high-risk sectors/geographies. These are critical indicators of market risk perception and signal potential impacts on collateral value and client financial viability (see Section 3.4 for more on the interplay with insurance).

In addition, different sectors are inherently exposed and sensitive to various physical climate risks, irrespective of specific policies. Sectors have different fundamental vulnerabilities (e.g., agriculture to changing rainfall, coastal real estate to sea-level rise). Understanding these helps contextualize portfolio risk (Section 1.2) and prioritize sectors for strategic focus (Section 2.1). Banks can use scientific reports (like IPCC), industry research, sectoral vulnerability assessments, and emerging A&R solution taxonomies (see Annex

D for examples) to understand these inherent risks. (Annex B provides detailed context for the Real Estate and Agriculture sectors).

Analysing these dynamic market and sector factors helps banks anticipate shifts, identify viable business opportunities, refine risk assessments (Section 1.2), prioritize sectors for strategic focus (Section 2.1), and tailor client engagement strategies (Section 3.3).

Banks can consider the progressive actions outlined in Box 1 as they develop their understanding of the policy and market context for A&R.

Box 1: Illustrative progressive approach for understanding policy and market context

Getting started

Intended outcome: The bank identifies and engages with the national adaptation strategies of the markets in which it operates to identify potential physical climate risks and A&R opportunities.

- Identify national A&R priorities from NAP summaries or equivalent policies.
- Identify key policy trends in main sectors (e.g., new water usage regulations).

Responsible practice

Intended outcome: The bank develops a systematic process for monitoring A&R policies, market dynamics, and competitor activities, informing its strategic, product, and risk approaches.

- Track NAPs, NDCs, and relevant sub-national/sectoral plans systematically (e.g., using assigned staff/alerts).
- Analyse competitor A&R offerings and emerging adaptation solutions in priority sectors.
- Monitor insurance market signals (pricing, availability) in high-risk areas.

Leading practice

Intended outcome: The bank actively participates in policy dialogue to inform and support policy development alongside integrating public policy objectives within commercial strategy.

- Participate actively in policy dialogues and collaborate with market/sector bodies (e.g., contributing to NAP reviews, trade bodies positions).
- Analyse wider systemic risks and connections (e.g., cross-sector policy impacts from policy/market news).
- Quantify or qualify, where feasible, how policy gaps or inaction could translate into future client/portfolio financial risk.

1.2 Physical climate risk assessment

Understanding and assessing physical climate risk is fundamental for informed decision-making by banks. This section outlines how banks can progressively conduct PCRA, from initial portfolio screening to more detailed analyses for higher-risk areas, helping to identify where adaptation finance is most needed. A list of relevant data sources and tools to support banks in PCRA can be found in Annex D.

1.2.1 Understanding the components of PCRA: Hazard, exposure, vulnerability

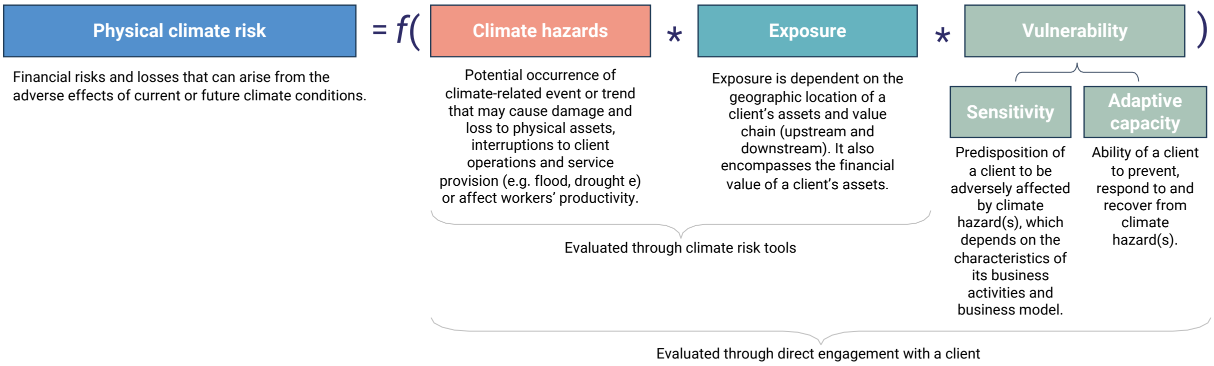


Figure 4: The physical climate risk equation | (Source: Adapted from IPCC AR5/AR6 ARIC Physical Climate Risk Assessment and Management An investor playbook)

Figure 4 illustrates the core components of physical climate risk: the potential hazard, the exposure of assets or activities to that hazard, and the inherent vulnerability (comprised of sensitivity and adaptive capacity) of those assets or activities to the hazard's impacts.

A climate hazard is a potential climate-related event or trend that could cause loss or damage. Assessing hazards involves considering:

- **Types of hazards**: identifying relevant acute hazards (e.g., flooding, heat stress, etc.) and chronic hazards (e.g., sea-level rise, shifting precipitation patterns, etc.) based on the location and sector.
- **Climate scenarios**: assessing hazards under different climate scenarios representing various future emissions trajectories, from lower emissions (Paris-aligned) to higher emissions ('business-as-usual').
- **Time horizons**: evaluating hazards over relevant time horizons aligned with the bank's lending periods and strategic planning cycles (e.g., short-term for operational planning, medium-term for typical loan tenors, long-term for strategic asset allocation).
- **Data sources**: using credible sources like public data portals, commercial providers, academic research, and major assessments (e.g., IPCC reports). UNEP FI resources[4] can help identify relevant data providers.

4 UNEP FI maintains resources, including the Climate Risk Landscape report and a database, which catalogue various data providers and tools for both climate-related physical and transition risk assessment.

Exposure is the presence of assets, people, or activities in locations that could be adversely affected by a climate hazard. Assessing exposure involves identifying:

- **Geographic location**: The specific locations of clients' key physical assets and operations relative to identified hazards. Granular data (e.g., precise addresses) is preferable.
- **Financial value**: The financial value of these exposed assets, informing the potential magnitude of loss, and the financial exposure of the bank to that asset.
- **Value chain dependencies**: Where feasible, assessing climate-related risks within the client's upstream (e.g., key suppliers, resources) and downstream (e.g., logistics, markets) value chains, as disruptions can impact a client even if direct assets are unharmed.
- **Level of analysis**: exposure can be analysed at various levels (asset, client, sector, portfolio, country) depending on context, data availability, and purpose. Where asset-level data is lacking, proxies or aggregated data may be used initially, acknowledging limitations.

Vulnerability is the tendency of an exposed client, asset, or system to be adversely affected by a climate hazard. It includes:

- **Sensitivity:** how prone the client's specific business, assets, or operations are to being negatively affected by a particular hazard type. Sensitivity varies significantly by sector, sub-sector, and asset type (e.g., agriculture is highly sensitive to drought; coastal properties to sea-level rise). Measuring sensitivity often needs specific local information like engineering studies or expert analysis.
- **Adaptive Capacity** is the ability of the client or system to adjust to climate conditions, reduce potential damage, use opportunities, or respond effectively. Assessing adaptive capacity is key and often requires direct client engagement (Section 3.2) to be effectively assessed. Key factors include:
    - Financial resources: Does the client have the means to implement measures or absorb losses?
    - Know-how and Governance: Does the client possess technical understanding and have structures (e.g., aligned with TCFD) to manage climate risks?
    - Insurance and wider financial risk management tools: Is adequate and affordable insurance available and maintained for relevant perils? (Lack of insurance significantly increases vulnerability—see Section 3.4).
    - Operational flexibility: Can the client adjust operations or sourcing in response to events?
    - Existing measures: What adaptation or risk management actions has the client already implemented?

Typically, higher adaptive capacity means lower vulnerability, even if sensitivity is high. Banks might also consider how climate vulnerability intersects with other socio-economic or environmental stressors, such as poor infrastructure or social inequalities. PCRA is an iterative process; assessments should be periodically reviewed and updated based on new information, client actions and monitoring insights (Section 1.3).

1.2.2 The PCRA process: A step-by-step approach

Banks can approach PCRA in phases, potentially starting with portfolio-level screening (Annex C.1) and progressing to more detailed assessments for high-risk areas (Annex C.2), as data and resources allow. The necessary data granularity and assessment methodology will also depend on whether the bank's goal is broad portfolio screening or detailed counterparty due diligence. Once an asset, client, or portfolio segment has been identified as requiring assessment (often through initial screening), the PCRA process typically involves these steps:

Step 1: Gather client data inputs

The quality and detail of PCRA depend heavily on available data, primarily client sector, financial and location information. Banks should aim for the most detailed data possible, using existing records, public disclosures, commercial data, or direct client engagement, or identify proxy methods for addressing data gaps or poor quality data where necessary.

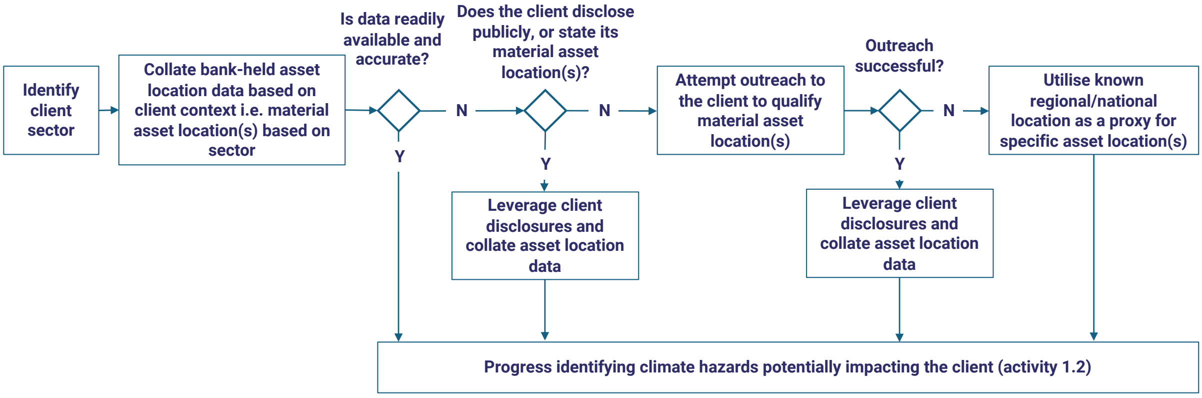


Figure 5: Client/asset data capture process (illustrative approach)

Figure 5 illustrates a potential workflow for gathering client asset location data, starting with readily available information and progressively seeking more detail through methods like client questionnaires or direct engagement, while managing potential data gaps. Banks should recognize that data is dynamic and requires periodic reviews.

Step 2: Identify relevant climate hazards

Once locations are known (or estimated using the best available proxy data), identify the material acute and chronic climate hazards. This is based on location and sector, considering different climate scenarios and time horizons, and using credible data sources (1.2.1).

Step 3: Determine physical climate risk materiality

A goal of PCRA is determining if an identified physical climate risk is material. Here, materiality means whether the risk is significant enough to potentially influence the bank's decisions (e.g., lending terms, pricing, risk appetite, strategy), harm the client's financial health or operations, or affect the value of assets held as collateral. Understanding materiality helps prioritize assessment efforts and decide next steps. This step involves assessing the combined effects of hazard intensity and probability, the value and sensitivity of exposed assets/operations, and the client's adaptive capacity. The outcome (e.g., low, medium, high-risk rating, as defined by the bank) determines the necessary follow-up actions. The definition of physical climate risk materiality and rating is completed by the bank, and will vary by bank based on overall risk appetite, financing context, portfolio composition, regulatory environment, data availability, etc. It is an important step to define these criteria and associated thresholds internally.

Step 4: Determine the need for physical climate risk due diligence

Following the materiality assessment (Step 3), the bank decides on the appropriate next steps based on its defined risk ratings.

Step 5: Moving from risk assessment to active risk management

The aim of this guidance is to encourage credit institutions to advance to evolving risk assessment and monitoring approaches that encourage risk monitoring teams to revisit credit and stress testing models, while encouraging proactive risk management, through the development of risk transfer and A&R solutions that enable clients to become more resilient and better manage risk across the organization's portfolio. These approaches are covered over the subsequent sections of this guidance.

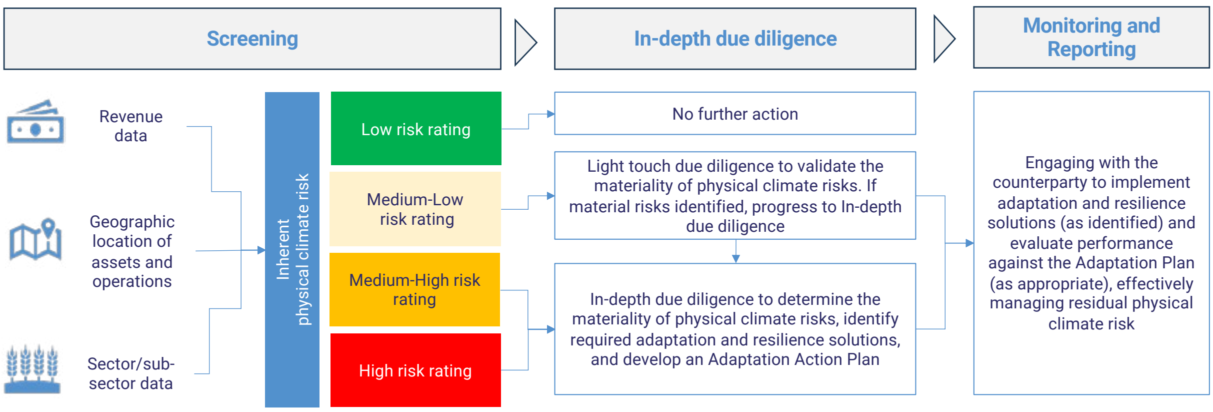


Figure 6: Integrating physical climate risk assessment and management in bank financing processes (illustrative approach). Adapted from ARIC Physical Climate Risk Assessment and Management an Investor Playbook

Figure 6 illustrates how the PCRA materiality assessment integrates into the bank's financing processes. A low-risk rating may only need ongoing monitoring, while medium or high ratings might trigger the need for in-depth due diligence (depending on bank definition). This deeper dive involves working closely with the client (see Section 3.2) to fully understand the risks, validate existing A&R measures and adaptive capacity, identify necessary additional solutions, and potentially develop a formal adaptation action plan. Banks may consider the physical climate risk impact channels (Figure 7) to collaborate with clients in identifying material risk factors and developing adaptation action plans (as required).

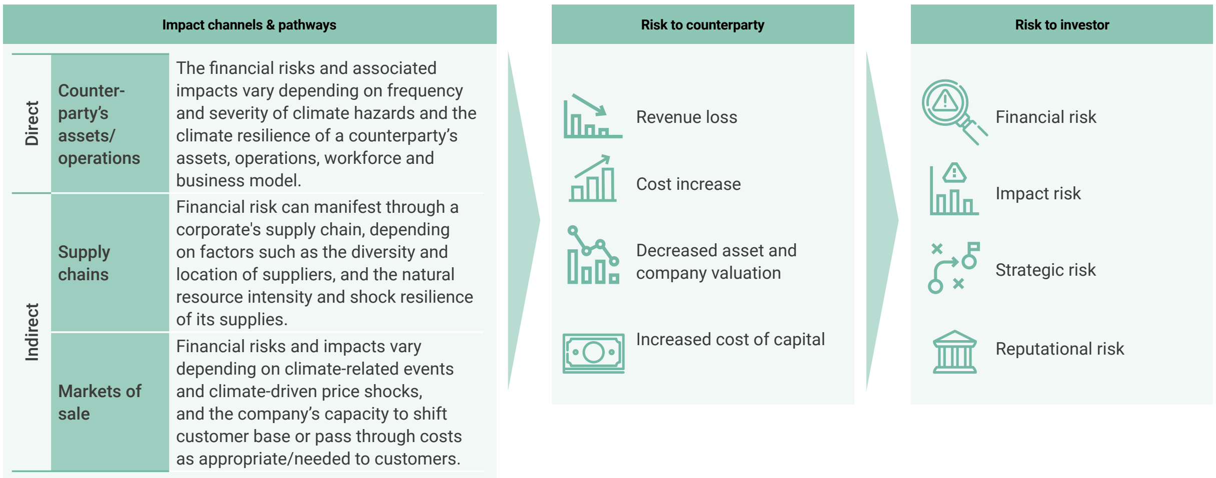


Figure 7: Physical climate risk channels. Source: [ARIC Physical Climate Risk Assessment and Management an Investor Playbook]

Subsequent monitoring (Section 1.3) tracks the implementation of agreed actions and manages residual physical climate risk over time. Box 2 illustrates how banks can progressively approach PCRA.

Box 2: Illustrative progressive approach for PCRA

Getting started

Intended outcome: The bank identifies the physical climate risks to its portfolio and assesses the materiality of these risks to inform subsequent action.

- Compile readily available client location data (e.g., HQ addresses, main sites), using proxies where data gaps exist.
- Screen the portfolio at a high level using public hazard data (e.g., basic flood maps) for key geographies.
- Determine physical climate risk materiality and identify bank action to address material risk factors/areas.

Responsible practice

Intended outcome: The bank undertakes exposure and vulnerability assessments and integrates physical climate risk assessment in all originations.

- Implement portfolio-level PCRA focusing on key hazards and priority sectors/regions, assessing exposure and vulnerability.
- Gather more granular client asset location data (e.g., via questionnaires, existing records) to enhance data quality and risk assessment accuracy.
- Document data gaps and PCRA methodology limitations clearly.
- Use robust data management systems and protocols for granular A&R data.

Leading practice

Intended outcome: The bank increases granularity and sophistication of risk assessment, increasing data accuracy, incorporating forward-looking risk assessment, and connecting physical climate risk to financial valuations.

- Conduct granular, asset-level PCRA for high-risk/material exposures, using forward-looking scenarios (e.g., IPCC, NGFS).
- Increase risk assessment scope and sophistication through further value chain analysis.
- Integrate PCRA results into credit risk models and collateral valuation processes (e.g., adjusting PD/LGD).

1.3 Monitoring progress and performance

Monitoring provides the crucial data link between the **Assessment** (baselines from 1.1 and 1.2), the **Strategy** (2), and future **Actions** (3). It is about tracking changes over time, evaluating actions, and providing insights to manage risks and adapt strategies over time. Without effective monitoring, baselines become outdated, targets lose meaning, and the bank cannot effectively learn or show progress. This section outlines key areas for banks to consider.

1.3.1 Dimensions for A&R monitoring

Based on the initial assessments, banks may establish monitoring capabilities across several interconnected dimensions. Monitoring can occur at both the granular client-level (tracking individual progress) and the aggregated portfolio-level (assessing overall trends and exposures).

Portfolio risk exposure: Tracking how the bank's overall exposure to physical climate risks is evolving.

- **What it involves:** Monitoring changes in portfolio concentrations in high-risk sectors/geographies (identified in 1.1 and 1.2):
    - Tracking aggregated top-down metrics (e.g., '% of portfolio exposed to high water stress' using geospatial overlays), or
    - Aggregating bottom-up client-level risk data (where available) to understand portfolio trends, including assessment of adaptation measures that influence the risk to a client.
- **Why it matters:** Provides a strategic view of risk, informs adjustments to risk appetite and overall strategy, and highlights areas requiring attention.
- **Data needs:** Requires updated climate science/hazard data and refreshed client location/activity data.

Client risk and adaptation progress: Monitoring changes in the risk profiles and adaptive capacity of individual clients, especially high-risk clients.

- **What it involves:** Tracking if/how clients are implementing agreed adaptation action plans and building resilience (see Section 3.2); assessing changes in client vulnerability and adaptive capacity based on new measures or changing hazards; potentially using client surveys or Relationship Manager (RM) check-ins.
- **Why it matters:** Evaluates the effectiveness of bank support and client actions in building resilience and reducing risk; informs residual risk assessment for credit decisions.
- **Data needs:** Requires structured client interaction, potentially specific reporting covenants, or third-party verification.

Financial performance link: Assessing the relationship between physical climate risks, adaptation measures, and financial outcomes.

- **What it involves:** Analysing correlations between client resilience measures and financial performance (e.g., improved cash flow stability, enhanced productivity); tracking loan performance (e.g., NPLs) in hazard-affected areas, potentially comparing clients with/without adaptation measures; monitoring both negative climate impacts and positive adaptation benefits on collateral values (LTVs). This involves gathering evidence to understand relationships, rather than direct influence at this stage. Initially, banks can focus on qualitative observations or tracking simpler metrics (e.g., comparing loan performance in high-risk areas for clients with and without A&R measures) before attempting deeper integration into complex financial models. The aim is to see how client resilience actions, often supported by bank financing or engagement, correlate with financial outcomes.
- **Why it matters:** Builds the business case for A&R (demonstrating both risk mitigation and potential performance improvements); refines credit risk models and underwriting; justifies A&R financing and related product pricing/incentives. Evidence of a positive financial performance link can also demonstrate the effectiveness of the bank's A&R interventions and client adaptation efforts.
- **Data needs:** Requires integrating climate risk/A&R data with standard financial performance data; potentially advanced analytics.

Target performance: Tracking progress against the specific A&R targets set in the institution's, Strategy (Section 2.3).

- **What it involves:** Measuring progress towards practice targets (e.g., number of RMs trained, % high-risk clients supported with A&R finance) or positive contributions via impact targets (e.g., finance mobilized for verified resilience outcomes, A&R co-benefits like biodiversity gains or water savings).
- **Why it matters:** Ensures accountability; demonstrates progress to stakeholders; identifies areas where strategy execution is lagging.
- **Data needs:** Relies on KPIs defined during target setting, drawing data from relevant internal systems (training records, CRM, loan books).

Wider impacts (co-benefits and trade-offs): Monitoring broader positive and negative consequences.

- **What it involves:** Tracking key indicators related to co-benefits (e.g., biodiversity improvements from Nature-based Solutions (NbS) projects, water savings, job creation); monitoring continued adherence to criteria for avoiding significant harm and maladaptation in financed adaptation projects, especially if linked to specific frameworks (e.g., EU Taxonomy).
- **Why it matters:** Ensures A&R efforts contribute positively overall; supports holistic resilience goals and wider sustainability objectives (e.g., related to nature and just transition); meets regulatory/investor expectations on sustainable finance.
- **Data needs:** May require specific project-level data collection, potentially involving clients or third parties; alignment with relevant sustainability reporting standards.

1.3.2 Using monitoring insights for continuous improvement

Monitoring is more than just data collection; its purpose is to provide the evidence needed for continuous improvement of the bank's A&R approach. This is particularly important in A&R due to the complexity and continuous evolution of the topic. Specifically, monitoring data provides evidence to:

- **Revalidate or update initial Assessments** (Sections 1.1 and 1.2)**:** Confirming if hazard exposure is changing as expected, if client vulnerability is reducing due to implemented measures, or if market trends necessitate a shift in understanding opportunities.
- **Refine Strategy** (Section 2)**:** Informing adjustments to strategic priorities, risk appetite thresholds, and the relevance or ambition level of A&R targets based on actual performance and evolving external context.
- **Guiding Actions** (Section 3)**:** Guiding modifications to client engagement approaches, product design based on effectiveness, or internal process improvements identified through monitoring.

Actively using monitoring insights in an iterative way ensures the bank's A&R approach remains effective, relevant, and dynamically responds to evolving climate realities and market conditions, and interlinkages with other sustainability topics.

For an illustrative progressive approach to monitoring A&R progress and performance, see Box 3.

Box 3: Illustrative progressive approach for monitoring progress and performance

Getting started

Intended outcome: The bank defines basic A&R metrics (see Annex D and the PRB Adaptation Target Setting guidance for examples) and initial qualitative baselines.

- Define 1–2 simple KPIs using initial portfolio screening data (e.g., % exposure to high flood risk).
- Document an initial, qualitative baseline for key A&R exposures or significant client vulnerabilities.

Responsible practice

Intended outcome: The bank implements systematic A&R target tracking with clear KPIs and clear data protocols to measure progress against the strategy.

- Establish clear quantitative baselines for portfolio risk exposure and key client segments.
- Define and track KPIs aligned with A&R targets (e.g., client engagement progress, resilient finance volumes).
- Establish a clear internal process for defining, agreeing, and sourcing necessary monitoring data.

Leading practice

Intended outcome: The bank leverages comprehensive, integrated monitoring to dynamically refine strategy and track real-world resilience outcomes.

- Implement integrated monitoring systems tracking diverse KPIs (e.g., risk, financial, client adaptation, co-benefits, maladaptation).
- Integrate monitoring insights into a formal feedback loop to dynamically update risk assessments (e.g., revising materiality ratings) and strategy (e.g., adjusting targets).
- Track and quantify, where feasible, the tangible resilience benefits achieved by financed activities (e.g., reduced losses, improved adaptive capacity), linking these to the bank's impact targets.

2. Strategy

The Strategy (Section 2) cornerstone focuses on translating assessment insights into a clear direction and ambition for the bank's A&R efforts. This section details the formulation of A&R strategy (Section 2.1), the establishment of effective governance (Section 2.2), and setting meaningful targets (Section 2.3).

2.1 Defining the Strategy

An effective A&R strategy translates the insights from **Assessment** (1)—including policy trends, market needs, sector vulnerabilities, and the bank's own risk exposure profile—into a clear roadmap for managing physical climate risks and supporting the transition towards a nature-positive, just and climate-resilient economy. Particularly, understanding government A&R priorities and policy directions (as analysed in Section 1.1) is crucial for aligning the bank's strategy with national efforts and identifying supportive regulatory environments or potential public-private partnership opportunities. This strategy should be tailored to the bank's specific business model, portfolio composition, operating regions, and regulatory environment. A&R strategy should be integrated with wider bank strategy to ensure alignment with commercial and risk strategies, regulatory requirements and wider bank considerations in pursuit of resilience objectives.

An A&R strategy clearly articulates:

- **Strategic priorities:** The specific sectors, geographies, or client segments where the bank will initially concentrate its A&R efforts.
- **Risk appetite:** The level of physical climate risk the bank is willing to accept within its portfolio. This might involve setting thresholds or limits for high-risk exposures and potentially incorporating principles to avoid financing harmful activities.
- **Market approach:** The bank's ambition and approach for financing A&R, outlining key market opportunities it aims to pursue.
- **Portfolio balancing:** How the strategy balances mitigating physical climate risks within the existing portfolio while also proactively seeking opportunities to finance adaptation solutions.
- **Systemic contribution:** Strategies may also explicitly articulate how the bank's A&R efforts contribute to broader resilience and tackling systemic risks.

As the bank progresses, these strategic priorities should evolve into a comprehensive strategy that is science-informed, forward-looking (using climate scenarios), and integrated with broader sustainability goals. Banks should maintain flexibility and responsiveness in operations, product offerings, and client engagement approaches, adapting to evolving client needs, A&R solutions, and understanding of the physical climate risk context. Box 4 provides examples of how banks might progressively define their A&R strategy:

Box 4: Illustrative progressive approach for defining strategy

Getting started

Intended outcome: The bank formally acknowledges physical climate risks and defines an initial focus for its A&R efforts.

- Develop a basic internal statement acknowledging physical climate risks and the bank's intent to address them.
- Identify 1–2 priority sectors or regions for initial adaptation strategy and action based on early risk/opportunity assessment.

Responsible practice

Intended outcome: The bank establishes a formal A&R strategy—either integrated within or clearly linked to its broader sustainability/climate goals.

- Formalize A&R objectives, either by embedding them within broader sustainability/climate strategy documents or by creating a dedicated A&R strategy clearly linked to overall sustainability goals.
- Define a clear risk appetite for A&R-related physical climate risk (e.g., qualitative statements, basic quantitative thresholds).
- Outline how the strategy connects A&R risk management and opportunity creation within focus areas.

Leading practice

Intended outcome: The bank develops an advanced A&R strategy that is forward-looking, science-informed and responsive to client's evolving needs and physical climate risk context.

- Develop a comprehensive, science-informed, and forward-looking A&R strategy, based on scenario analysis using recognized industry standard scenarios e.g., IPCC or NGFS.
- Integrate the A&R strategy fully with broader sustainability objectives, including explicit criteria to avoid significant harm to other sustainability objectives and prevent maladaptation.
- Define a sophisticated and dynamic A&R risk appetite framework adaptable to changing conditions.
- Build adaptability into the A&R strategy through formal review cycles that assess the effectiveness of current approaches and solutions against evolving conditions, allowing for tactical adjustments within the overarching strategic direction.
- Focus the A&R strategy on delivering measurable resilience benefits, potentially using impact targets.

2.2 Establishing governance

Effective A&R governance, tailored to a bank's context and model, is key for embedding strategy, ensuring accountability, and overseeing the strategy's implementation. This typically involves clear structures, defined responsibilities, appropriate risk management frameworks, and robust information flows[5]. This section focuses on designing the overall governance framework, including defining high-level structures, key roles, and responsibilities. The operational processes and internal foundations that bring this framework to life are discussed in Section 3 (Action).

Accountability and oversight

To ensure strategic alignment and drive implementation, ownership and oversight typically resides at senior levels (Board and/or Executive Committee). Table 2: provides an illustrative example of how high-level responsibilities for A&R strategy might be distributed.

Table 2: Illustrative high-level governance roles and responsibilities for A&R

Action	Responsible functions	Engaged functions
(Note: This is illustrative; specific functions and lead/support roles vary by bank structure. Engagement of functions may focus on specific inputs relevant to their expertise.)		
Develop A&R strategy and roadmap	Sustainability and strategy, finance	Business lines, risk management, policy and external relations (non-exhaustive)
Define A&R bank targets	Sustainability and strategy, finance	Business lines, risk management, policy and external relations (non-exhaustive)
Monitor portfolio against targets	Risk management, finance	Business lines, sustainability and strategy
Report performance to ExCo/Board	Sustainability and strategy or Risk Management (as appropriate)	

2.2.1 Defined roles and responsibilities

Banks should carefully consider how roles and responsibilities for implementing A&R strategy are allocated. The specific approach, whether, for example, more centralized or federated, will depend on the individual bank's operating model and A&R strategy (Table 3 in Section 3 provides examples of operational roles). Independent of operating model, it is critical that these responsibilities are clearly defined across the bank, and the dependencies between different functions/business units and geographies are appropriately mapped and managed to ensure the A&R strategy is successfully implemented.

5 The PRB Guidance on Effective Governance equips banks to implement sustainability strategies through effective practice case studies and supporting tools.

2.2.2 Integrating A&R into existing structures

Rather than creating entirely separate A&R structures, banks should leverage and adapt existing governance mechanisms. This includes:

- Incorporating A&R into the mandate of existing committees (e.g., risk committee, sustainability committee)
- Mapping A&R responsibilities clearly onto existing roles
- Embedding A&R considerations into job descriptions and potentially performance evaluations.

2.2.3 Defining risk management roles and responsibilities

Clear roles and responsibilities are important for managing A&R-related risks. Banks can structure this by defining how different functions contribute to identifying, assessing, managing, and overseeing these risks.

One common approach is the 'three lines of defence' model, which can be adapted for A&R, though the specific implementation will vary:

First Line: Individual bank functions within business lines (e.g., RMs, portfolio managers) are responsible for identifying and managing A&R risks in their day-to-day operations.

Second Line: Risk management and compliance functions facilitate and monitor the effectiveness of risk management practices, define risk exposure limits, and provide reporting.

Third Line: Internal (and potentially external) audit provides independent assurance on the effectiveness of governance, risk management, and internal controls related to A&R.

Other models or tailored structures can also be effective, provided they ensure clear accountability and oversight.

2.2.4 Internal reporting for oversight and decision-making

Effective governance relies on timely and relevant information. Internal management reporting should consolidate data gathered through monitoring (Section 1.3 and associated processes within Section 3) to inform governance bodies including the Board and ExCo, and senior management. This reporting provides key insights for oversight and strategic adjustments, covering areas such as:

- Current A&R risk exposures across portfolios and key sectors
- Progress against strategic A&R targets (see Section 2.3)
- Effectiveness of implemented A&R measures (where monitored)
- Emerging risks or opportunities identified through ongoing assessment.

This internal reporting enables the Board and senior management to exercise effective oversight, make informed strategic decisions, allocate resources appropriately, and ensure accountability for A&R performance. Centralized reporting structures can help consolidate information from various functions, providing a holistic view. This reporting is fundamental to the continuous improvement cycle, enabling informed adjustments to strategy and actions, as discussed in Section 4.

Banks can progressively establish and enhance their A&R governance through steps such as:

Box 5: Illustrative progressive approach for establishing governance

Getting started

Intended outcome: The bank establishes initial A&R coordination and raises awareness within existing committee structures.

- Assign an A&R point person or coordinator for A&R (e.g., from an existing risk or sustainability function).
- Raise initial A&R awareness in relevant existing committees (e.g., risk committee).
- Start raising physical climate risk topics for qualitative discussion within regular risk management forums.

Responsible practice

Intended outcome: The bank implements more formal A&R governance, ensuring clear roles and oversight enable staff understanding and effective management of A&R responsibilities, supported by foundational reporting.

- Define and document clear A&R roles and responsibilities across key bank functions.
- Update relevant committee mandates to explicitly include A&R oversight and reporting to senior management.
- Clarify how A&R risk ownership, oversight, and independent assurance are distributed across relevant bank functions (e.g., three lines of defence)
- Establish basic internal reporting on A&R risk exposures and progress against targets.
- Ensure A&R governance aligns with broader climate or transition plans.
- Establish basic principles for A&R data governance (e.g., identifying data owners for key metrics).

Leading practice

Intended outcome: The bank implements leading A&R governance, featuring dedicated senior leadership, an active champions' network, A&R-linked performance accountability, and advanced data-driven strategic oversight.

- Establish dedicated senior-level A&R oversight (e.g., a specialized committee or high-level working group with clear mandate).
- Foster an active 'climate champions' network active across departments to embed A&R knowledge and drive engagement.
- Integrate A&R responsibilities, and potentially related KPIs, into relevant performance evaluations and incentive structures.
- Develop consolidated A&R reporting dashboards with diverse metrics to support proactive strategic oversight and decision-making.
- Implement a process for periodically reviewing and adapting A&R governance structures to maintain effectiveness.
- Implement comprehensive A&R data governance, including clear policies for data quality, access, and usage in decision-making.

2.3 Target-setting: Translating strategy into action

Once an A&R strategy sets the overall direction and ambition (Section 2.1), targets translate that strategy into concrete, measurable actions. They define what successful implementation looks like, focusing efforts and resources. While the nature and disclosure of targets remain at each bank's discretion aligned with its strategic priorities, setting targets—whether initially for internal progress or evolving towards those with external relevance—is crucial for driving progress and demonstrating commitment to resilience. Targets are crucial for understanding how effectively a bank is moving from its internal actions towards influencing real-world resilience outcomes, a pathway illustrated in the *PRB Climate Adaptation Target-Setting Guidance* theory of change (Figure 8). Over time, insights from monitoring target achievement can also feed back into refining the strategy itself (Section 4). This guidance encourages banks to begin their target-setting journey at a point that is practical for them, recognizing that even foundational targets and action on priority areas or thematics contribute to building momentum and capability for more comprehensive approaches over time.

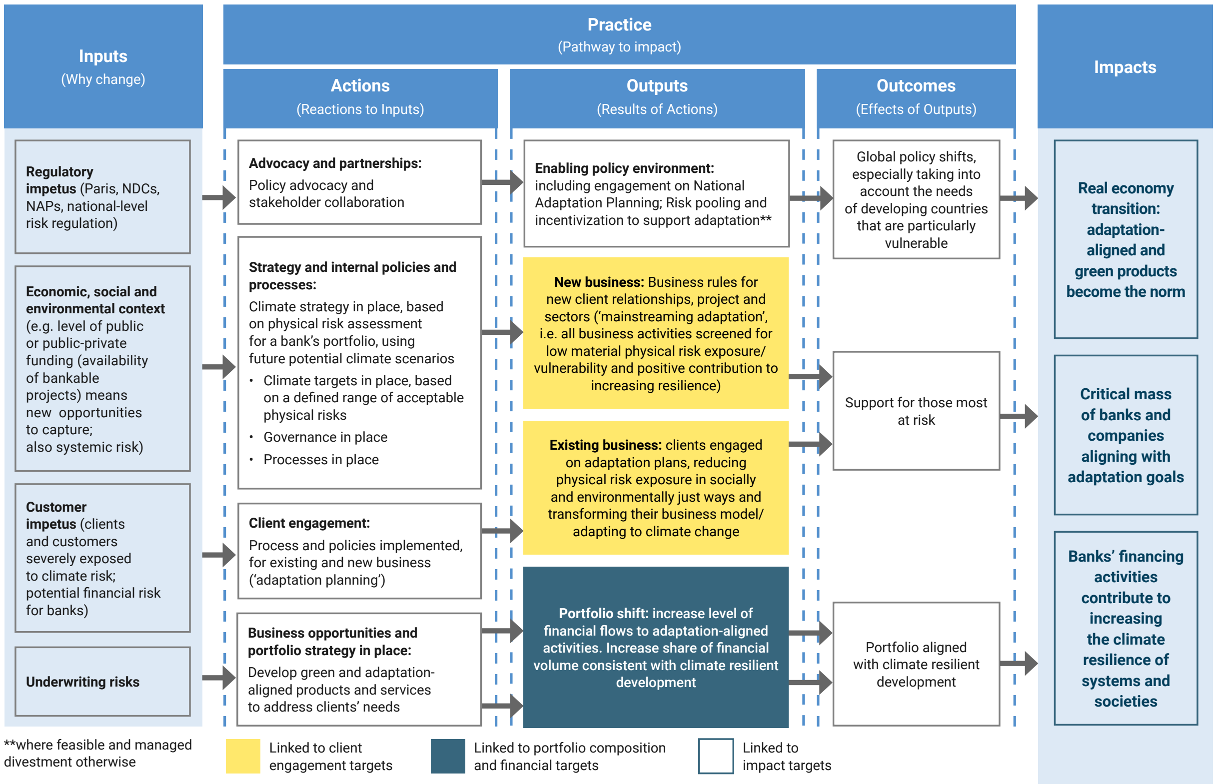


Figure 8: Theory of change for climate A&R (Source: 2023 PRB Climate Adaptation Target-Setting Guidance).

This section outlines the types of targets banks may set, the progressive approach recommended, and key considerations, drawing heavily on the detailed framework in the PRB Adaptation Guidance (UNEP FI, 2023, Chapters 4 and 5). Banks can refer to that specific guidance for detailed approaches, indicator lists, and in-depth recommendations on setting targets. The below target guidance provides context for the implementation activities described in Section 3.

2.3.1 Key principles for targets

The following principles provide guidance in developing effective A&R targets. While banks will progress towards fully embodying all these aspects over time, particularly as their A&R capabilities mature, these principles provide a framework for designing targets that are robust, meaningful, and contribute genuinely to resilience. Regardless of the type or maturity level, effective A&R targets should aim to:

- Be SMART (Specific, Measurable, Achievable, Relevant, and Time-bound)[6].
- Directly support the bank's overall A&R strategy, priorities, and risk appetite (Section 2.1).
- Reflect the risks and opportunities identified (Section 1).
- Clearly state the portfolio segment (sectors, regions, client types) they apply to.
- Align with relevant national (e.g., NAPs) and international frameworks, where applicable.
- Use defined KPIs for monitoring progress (Section 1.3).

6 While quantitative targets are typically preferred for clear progress tracking, qualitative targets (e.g., 'develop and implement an A&R training program for all relationship managers by year-end') are also beneficial, particularly for initial capability-building practice targets. In qualitative cases, the 'measurable' aspect of SMART involves clearly defining what successful achievement of the qualitative target looks like.

- Be approved and overseen through the established governance structure (Section 2.2).
- Targets, and the activities they drive, may include features to avoid maladaptation, particularly for vulnerable communities, and significant negative unintended consequences, while actively seeking co-benefits for wider and equitable resilience.

Setting meaningful targets is an iterative process. Banks can expect to refine their targets over time as their understanding deepens, data improves, methodologies evolve, and their strategic ambition matures. Initial targets often focus on internal process improvements and learning. These are important first steps, building the foundation and capability that can pave the way for more comprehensive targets, including those that banks may choose to communicate more broadly as their A&R efforts mature and demonstrate impact. This evolution is supported by robust monitoring and learning mechanisms (Section 1.3 and Section 4).

2.3.2 Understanding practice targets

Practice targets focus on integrating A&R within the bank and directing its activities. The PRB Target-Setting Guidance (Section 4.1, Table 2) details three key categories related to the bank's 'actions' and 'outputs':

- **Strategy/internal policies and processes:** Targets related to embedding A&R risk assessment, management, and strategy into core functions (detailed in Section 3.3).
- **Client engagement:** Targets focused on interaction with clients to understand needs, raise awareness, and support action (detailed in Section 3.2).
- **Portfolio composition and financing:** Targets aimed at steering finance towards climate-resilient activities and managing exposures (detailed in Section 3.1).

For sample indicators and further examination of indicators, please refer to the 2023 Guidance.

2.3.3 Understanding impact targets

Impact targets, which are **considered leading practice**, represent an ambition to capture positive contributions to climate resilience in the real economy (the 'outcomes' and 'impacts' stage of the theory of change). While quantifying and setting targets for such contributions presents significant challenges, the 2023 Guidance (Section 4.2) outlines potential approaches including:

- **Positive contribution:** Focusing on additional resilience benefits beyond the financed activity itself.
- **Measurement challenges:** Acknowledging the significant difficulties in quantifying resilience outcomes, attributing specific impacts to bank actions (versus other factors), and securing reliable, consistent data for A&R impacts, especially when compared to the more established methodologies for mitigation targets.
- **Practical approaches:** Suggesting potential starting points like using Core Indicators (Section 5.2 of the 2023 Guidance), tracking finance mobilized, or focusing on project-level metrics.
- **Negative impacts:** Emphasizing the need to screen for maladaptation and other unintended consequences (e.g. by applying DNSH[7] criteria).

7 finance.ec.europa.eu/publications/frequently-asked-questions-eu-taxonomy_en

This document's practical focus on robust assessment (Section 1), integrated strategy (Section 2), and specific actions like client engagement (Section 3.2) and responsible product development (Section 3.1) addresses the considerations needed to work towards positive impacts despite current measurement challenges. While setting A&R impact targets is complex, banks can take practical steps:

- Explore evolving A&R-specific metrics (see Annex D for examples)
- Work to improve the A&R-related data gathered
- Learn from industry peers and experts on impact assessment
- Use simpler indicators or qualitative evidence where appropriate.

The focus is often on showing a credible contribution to resilience, rather than proving exact, sole responsibility for every outcome. While challenging, striving towards measurable impact targets reflects a commitment to contributing meaningfully to real-economy resilience.

Banks can approach target setting progressively, reflecting their current capabilities and strategic focus, through steps such as:

Box 6: Illustrative progressive approach for target setting

Getting started

Intended outcome: The bank sets initial, simple practice targets focused on building foundational A&R capabilities and understanding.

- Set 1–2 initial practice targets focused on building internal A&R capabilities (e.g., completing initial risk assessments, delivering basic awareness training).

Responsible practice

Intended outcome: The bank implements practice targets across key A&R areas (internal processes, client engagement, portfolio finance) to drive strategic execution and track progress.

- Define and implement practice targets covering key A&R strategy areas (e.g., client engagement levels, portfolio composition).
- Begin exploring relevant impact metrics (e.g., tracking finance flows to specific adaptation solutions), as an initial step towards measuring real-world effects.
- Ensure targets are linked to defined KPIs and baselines (from Box 3) and overseen by established governance (Box 5).

Leading practice

Intended outcome: The bank drives demonstrable real-world resilience impact through targets that are transparently measured and reported, and fully integrate potential harm and co-benefit considerations.

- Develop and set impact targets focused on measurable, real-world resilience outcomes, where data and methodologies allow.
- Embed screening for maladaptation and maximization of co-benefits into all target-setting processes.
- Employ sound impact measurement[8] methodologies and align impact targets with the A&R theory of change.
- Establish a process for dynamically reviewing and adapting targets and commit to transparently reporting on targets and progress.

8 The Adaptation and Resilience Investors Collaborative (ARIC) has developed a clear, consistent, and robust framework for measuring the impact of investments on climate adaptation and resilience. Banking practitioners may find this report useful in developing sound measurement methodologies.

3. Action

The Action section shows how banks put their A&R strategy into practice. Using insights from Assessment (Section 1) and direction from Strategy (Section 2), banks can act by: shaping their loan portfolio and finding business opportunities (Section 3.1), working effectively with clients (Section 3.2), improving internal policies, processes, and culture (Section 3.3), and understanding the critical link with the insurance sector (Section 3.4).

These activities allow banks to actively contribute to climate adaptation and resilience, translating strategy into tangible outcomes. This involves identifying and financing adaptation solutions (adapt), while also managing associated risks through approaches like risk transfer (transfer), avoiding excessive exposure based on the bank's risk appetite (Section 2.1) (avoid), and accepting residual risks (accept).

Operational roles in A&R implementation

Putting A&R into action requires different teams working together. While Table 2 outlines high-level responsibilities for defining the strategy, Table 3 provides examples of which bank functions are typically involved in the activities described in this section (specific roles will vary).

Table 3: Illustrative operational roles and responsibilities for day-to-day A&R implementation

A&R activity	Lead function(s)	Supporting function(s)
(Note: This is illustrative; specific functions and lead/support roles vary by bank structure.)		
Assessment		
Gathering/updating client and asset data	Business lines (incl. RMs)	▪ Data, analytics and technology (IT), ▪ Sustainability and strategy
Performing portfolio screening/PCRA models	Risk management, sustainability and strategy	▪ Data, analytics and technology (IT) (data science expertise) ▪ Business lines (providing input)
Assessing client adaptive capacity	Business lines (incl. RMs)	▪ Sustainability and strategy (expertise) ▪ Risk management
Monitoring policy and market trends	Policy and external relations, sustainability and strategy, finance	▪ Risk management ▪ Business lines
Strategy (input/support)		
Providing input on sector risks/opportunities	Business lines, sustainability and strategy (sector expertise)	▪ Risk management ▪ Finance
Action		
Engaging clients on A&R	Business lines (incl. RMs)	▪ Sustainability and strategy (expertise) ▪ Risk management (risk insights) ▪ Product development
Developing/structuring A&R-linked products	Product development, finance	▪ Sustainability and strategy ▪ Risk management ▪ Legal ▪ Business lines
Integrating PCRA into credit assessment	Risk management (credit risk oversight), business lines (underwriting)	▪ Risk management (modelling) ▪ Business lines (client info) ▪ Sustainability and strategy (context)
Implementing/tracking adaptation action plans	Business lines (incl. RMs)	▪ Sustainability and strategy (non-financial metrics) ▪ Finance (financial metrics) ▪ Risk management (risk metrics)
Building internal capacity/training	HR/L&D, sustainability and strategy	▪ Functional leads (risk management, business lines, etc.)
Implementing monitoring processes	Risk management, finance, sustainability and strategy	▪ Data, analytics and technology (IT) ▪ Business lines (data input)
Managing stakeholder engagement (excl. policy)	Finance (investor relations), communications, sustainability and strategy	▪ Business lines (RM for client perspective)

3.1 Shaping portfolio composition and financing

Implementing the A&R strategy involves actively managing the bank's loan portfolio and developing suitable financial products. Beyond managing current risks, it includes finding and funding opportunities that support clients and help build a more climate-resilient economy. This can also create positive environmental and social outcomes.

3.1.1 Identifying A&R finance opportunities

Opportunities for A&R finance arise from the need to implement technical solutions and improve adaptive capacity (identified during PCRA (Section 1.2), policy/market analysis (Section 1.1), and through client engagement (Section 3.2)). Identifying these opportunities and designing A&R financial products can be effectively guided by the bank's overall A&R strategy and its defined physical climate risk appetite (refer to Section 2.1). For instance, a bank with a lower tolerance for unmitigated physical climate risks might find it beneficial to prioritize products that strongly encourage client A&R measures.

Banks can qualify and quantify these opportunities by:

- Understanding the level of demand for specific adaptation solutions within target sectors/regions.
- Assessing if an A&R opportunity makes good financial sense. This involves looking at how climate change might affect a client's ability to repay loans, the value of their assets (which impacts loan-to-value ratios, or LTVs), and the expected return (e.g., internal rate of return, or IRR) from the project.
- Comparing the 'cost of inaction' with the benefits, including co-benefits, of A&R.
- Considering structured finance options, especially for emerging markets or higher-risk projects (see 3.1.4).

The worked example in Annex C.4, assessing RRE retrofit viability, illustrates how market demand and financial analysis can identify such opportunities.

3.1.2 Financing systemic resilience

Beyond individual clients, banks can finance projects that build resilience for whole systems (like infrastructure or ecosystems), reducing risks across their portfolio. Examples include:

- Joining public-private partnerships for resilient infrastructure
- Creating finance structures for large Nature-based Solutions e.g., restoring coastal wetlands
- Supporting community-level adaptation initiatives.

Financing these complex projects may require specialized expertise (like project finance), knowledge of blended finance (3.1.4), and working with public partners such as Development Finance Institutions (DFIs) and government bodies. While such projects can be challenging, they offer banks the potential to reduce broader risks, create new opportunities, and strengthen their reputation.

3.1.3 Developing financial products

Once opportunities are clear, banks can develop financing solutions, often using two main approaches:

Portfolio-based strategy: Standardized products or criteria applied across large segments (e.g., 'resilience-linked' criteria for mortgages).

Counterparty-based strategy: Tailored financing for individual borrowers (often larger/higher-risk) based on specific needs and plans.

Implementing these distinct strategies involves different approaches to data gathering and analysis. Portfolio strategies often use aggregated data and standardized metrics, while counterparty strategies typically rely on detailed, client-specific information gathered through direct engagement (Section 3.2). Tailoring A&R financial products to the specific needs, capacities, and risk profiles of different client segments—such as smallholder farmers versus large agricultural corporates, or distinct real estate sub-sectors—can enhance product uptake and effectiveness.

Banks can adapt existing products or create new ones (see Table 4) to incentivize adaptation.

Table 4: Common types of financial products used to support climate adaptation

Financial Product	Description
Incentivized loans	Offering attractive lending terms (e.g., reduced interest rates, longer tenors, grace periods) for loans financing specific, verified adaptation measures (e.g., mortgages for certified resilient homes, loans for drought-resilient farming practices).
Sustainability-linked loans	Linking loan terms (e.g., interest rate) to the borrower's achievement of pre-defined adaptation or resilience KPIs.
Use-of-proceeds instruments	Green or Sustainability Bonds/Loans where proceeds are explicitly earmarked for eligible adaptation projects, often defined by reference frameworks or taxonomies.
Specialized credit facilities	Providing working capital or bridge loans to support clients during periods of transition towards more resilient operations or infrastructure.
Risk mitigation and transfer products	Collaborating with insurers or using guarantees to offer products that manage residual climate risks (e.g., loans linked to maintaining insurance cover, exploring parametric solutions tied to loans, facilitating access to climate risk insurance).

The resilient mortgage development process (Annex C.4) illustrates designing a specific product based on market assessment. The resilient agriculture portfolio strategy (Annex C.3) shows a portfolio-level approach integrating resilience into collateral valuation.

When designing products and deciding which activities qualify, banks can refer to established or emerging frameworks (see Annex D) to help ensure credibility and alignment. Examples include established taxonomies, such as the Climate Bonds Resilience Taxonomy, or relevant sector standards. Banks might also use their own criteria, but should ensure these align with the bank's A&R strategy and regulatory requirements.

3.1.4 Leveraging Blended Finance and Guarantees for A&R

Getting finance to where it is most needed, e.g. in developing countries, for large systemic projects, or for new technologies, may require instruments that reduce financial risks, such as blended finance. Banks can use development finance or guarantees to lower investment risk and attract private capital through methods like:

- **Partial credit guarantees:** DFIs/agencies guarantee a portion of the bank's loan, reducing credit risk.[9]
- **First-loss provisions:** A partner provides capital that absorbs initial losses in a portfolio of A&R loans, protecting the bank's senior position.
- **Concessional capital:** Blending the bank's commercial loan with lower-interest or longer-tenor loans (or grants) from a development partner, improving overall project viability.
- **Technical assistance funds:** Grants to help clients develop bankable projects or meet standards.

Beyond traditional blended finance structures that use concessional capital or first-loss provisions, banks, particularly those aiming for responsible or leading practice, can proactively explore instruments like credit guarantees or risk-sharing facilities. Developing these in partnership with public entities, DFIs, or insurers can help de-risk A&R investments. This approach can improve the bankability of projects that support resilience, especially in higher-risk contexts or for innovative solutions. Using blended finance strategically enables banks to expand A&R financing, enter new markets, and support impactful projects.

Banks can consider the progressive actions outlined in Box 7 as they shape their portfolio composition and develop A&R financial products.

9 The British International Investment (BII) paper on blended finance fund design may prove beneficial to banking practitioners in identifying where and how to leverage blended finance for A&R.

Box 7: Illustrative progressive approach for shaping portfolio composition and developing products

Getting started

Intended outcome: The bank identifies initial A&R financing opportunities and pilots initial A&R finance offerings to qualify client demand and uptake.

- Identify potential A&R finance opportunities (e.g., from NAP priorities, initial risk assessment).
- Pilot minor adjustments to existing financial products to reflect A&R priorities (e.g., adjusting loan criteria).

Responsible practice

Intended outcome: The bank establishes A&R financing solutions for priority sectors, incorporating maladaptation checks and exploring blended finance options.

- Assess the business case for potential A&R financing (e.g., costs vs. benefits, risk reduction).
- Develop standardized A&R loan products or lending criteria for priority sectors or client segments (e.g., incentivized loans).
- Explore blended finance opportunities to extend or enhance A&R product offerings or portfolio strategies.
- Integrate resilience factors directly into collateral valuation and LTV calculations.
- Incorporate checks for maladaptation and potential significant harm into A&R product development processes.

Leading practice

Intended outcome: The bank deploys innovative A&R financial solutions, actively finances systemic resilience, integrates resilience into valuations, and proactively shapes its portfolio towards climate resilience.

- Develop and deploy advanced A&R products (e.g., resilience-linked loans, use-of-proceeds instruments aligned with taxonomies).
- Finance systemic resilience projects (e.g., resilient infrastructure, NbS) via partnerships/blended finance.
- Engage in market development activities to overcome barriers and expand A&R finance.

3.2 Driving client engagement on A&R

Effective client engagement[10] is key to putting A&R into practice. It helps banks better understand and manage risks, work with clients on solutions, provide appropriate support, and financial products, and strengthen relationships. Effective client engagement can contribute to better A&R outcomes for banks and customers as outlined in worked examples within this guidance (Annex C.1, Annex C.2, Annex C.5, Annex C.6).

3.2.1 Perspectives on client engagement

Banks can approach client engagement strategies in two main ways:

Bank-led and driven: The bank initiates the conversation with clients, often triggered by its own risk assessments (Section 1.2) or strategy (Section 2.1). This could mean contacting clients in high-risk sectors/areas. Discussing risk is sensitive and banks should be mindful of this, with an emphasis on partnership and mutually beneficial outcomes in their engagements with clients. Sometimes, working through trusted groups like industry associations can be a good first step (Section 3.3.4). (see Annex C.1, Annex C.2 for examples).

Client-led and driven: The client approaches the bank with specific adaptation needs or projects, seeking finance or support. The bank uses its A&R strategy, products (Section 3.1.3), and assessment methodology (Section 1.2) to respond effectively. (Annex C.5 shows an example).

Whether the engagement is bank-led or client-led, it is helpful to consider that effective adaptation often relies on wider factors like infrastructure or policy. To address these wider factors, collaborating with key system actors—such as industry groups, local authorities, and others (see Section 3.3.4 for more on stakeholder partnerships)—can be important in making a real difference beyond individual client actions and to building broader systemic resilience.

3.2.2 A structured approach to client engagement

A structured approach to A&R client engagement can be incorporated into a bank's existing client relationship management and commercial processes, with banks aiming to enhance these standard procedures by adding specific climate resilience considerations. Over time, the goal is for these A&R discussions to become a natural and integrated part of overall client relationship management. Whether bank-led or client-led, the process typically involves the following four steps:

10 Banks primarily provide finance based on risk assessment and client plans. Engagement typically focuses on understanding client needs, assessing financing risks, explaining bank products, and encouraging clients to seek guidance from qualified technical or legal experts. Banking practitioners may take further reference from the PRB guidance on Client Engagement.

Step 1: Scene setting and opening dialogue

Goal: Introduce the A&R topic, establish context, and secure client willingness to collaborate.

- **Bank-led:** The RM, sometimes with specialist support, starts a discussion about the bank's focus on supporting client resilience. They may share high-level PCRA insights relevant to the client's sector or location (Annex C.1 illustrates how high-risk assets are identified through PCRA), explain the benefits of working together to understand specific impacts and A&R opportunities, and propose working together.
- **Client-led:** The RM seeks to understand the client's request (e.g., for financing climate-controlled storage, as illustrated in Annex C.5). The RM then explains how the bank's A&R assessment process can support the client's goals while ensuring responsible financing.

Outcome: Mutual understanding of the purpose for discussing A&R and agreement to proceed with a collaborative assessment.

Step 2: Needs assessment and awareness raising

Goal: Collaboratively deepen understanding of the client's specific A&R context, risks, vulnerabilities, and adaptive capacity.

Activities may include:

- Validating/refining initial PCRA findings (e.g., concerning exposure, sensitivity to specific hazards).
- Evaluating client adaptive capacity (e.g., governance, financial resources, technical knowledge, existing resilience measures and strengths; see Annex C.2 for an example of this assessment).
- Discussing current insurance arrangements and potential climate-related challenges (e.g., affordability, availability; see Section 3.4).
- Raising awareness of potential climate impacts, the costs of inaction, and various A&R options, including their potential co-benefits (like efficiency savings) and their estimated costs.

Key questions to consider: What are the main exposures? How sensitive are the client's operations or assets? What is their current level of adaptive capacity? Do they have A&R plans? What barriers (e.g., financial, technical, informational) does the client face?

Outcome: A shared, detailed understanding of the client's specific A&R risks, vulnerabilities, and capabilities.

Step 3: Defining support plan

Goal: Based on the shared understanding (Step 2), the bank and client collaboratively identify effective A&R solutions and define a support plan.

This step can involve exploring:

- Potential technical solutions (aiming for effectiveness and potential co-benefits) and any capacity-building needs. Support in this area often involves connecting clients with external technical specialists or resources.
- Suitable financing options from the bank's A&R product range (Section 3.1.3).
- Potential considerations to avoid maladaptation.

Outcome: Agreement on a clear set of actions to enhance resilience (often documented in a client adaptation plan). This might outline measures, timelines, and responsibilities, and forms the basis for potential financing or other bank support (e.g., as seen in the outcomes in Annex C.2 and C.5).

Step 4: Implementing support plan

Goal: Deliver the agreed support to enable the client's A&R actions and establish monitoring.

Activities may include:

- Structuring and potentially disbursing finance aligned with the client adaptation plan (Section 3.1.3 for product types).
- Facilitating connections with technical partners or resources (avoiding direct technical advice, per footnote 3).
- Refining the client's residual risk rating based on the agreed plan and implementation status (this informs credit decisions—see Annex C.2 outcome).
- Confirming monitoring arrangements to track progress against the plan and agreed KPIs (linking to Section 1.3 on monitoring principles); for high-risk clients, this includes periodically requesting information on A&R measures employed.

Outcome: The client begins implementing the plan, supported by the bank as agreed. A clear process is in place for monitoring progress and managing any residual risk.

Box 8 provides examples of how banks might progressively enhance their A&R client engagement.

Box 8: Illustrative progressive approach for driving client engagement

Getting started

Intended outcome: Engaging clients to build awareness and understanding of physical climate risk.

- Train RMs managing high-risk clients on fundamental A&R risk concepts.
- Engage clients identified as materially exposed to physical climate risk hazards to assess their A&R awareness, understanding and strategy.

Responsible practice

Intended outcome: Engaging clients to deepen physical climate risk awareness alongside building awareness and understanding of A&R solutions, and the bank role in supporting clients' A&R journey. Engaging with clients also helps to understand where wider systemic resilience needs to be reinforced and can be supported through wider engagement with industry associations and public administrations.

- Implement a structured A&R client engagement process for priority clients (e.g., covering needs assessment, awareness, defining support).
- Train relevant RMs more comprehensively on A&R risks, opportunities, and the bank's A&R financial solutions.
- Develop basic tools or questionnaires to help RMs discuss and understand client adaptive capacity.
- Establish a simple mechanism for RMs to feedback insights from client A&R engagements.

Leading practice

Intended outcome: The bank engages clients proactively with tailored A&R support, assisting with adaptation plans, connecting clients to solutions, and tackling wider systemic resilience challenges.

- Develop and implement tailored A&R engagement programs for distinct client segments (e.g., based on sector, risk profile).
- Proactively support clients in developing their own formal adaptation plans (e.g., by providing frameworks or facilitating workshops, while avoiding specific technical advice).
- Facilitate client access to external technical expertise, technology providers, or relevant implementation partners.
- Work with clients and wider system actors (e.g., local authorities, industry groups) to address shared systemic A&R challenges.
- Systematically integrate insights from client A&R engagements into the bank's monitoring systems, product development, and strategic reviews.
- Leverage technology where appropriate to enhance client engagement on A&R (e.g., information portals, self-assessment tools).

3.3 Enhancing internal policies, processes and culture

Success in A&R depends on strong internal foundations. This means embedding A&R into core policies and processes (3.3.1), managing data effectively (3.3.2), building staff capacity and a supportive culture (3.3.3), and working well with external stakeholders (3.3.4). Together, these elements support a bank's overall A&R implementation.

3.3.1 Embedding A&R into core policies and processes

Internal policies and processes are what drive consistent A&R action within a bank. Integrating A&R into policies and processes helps banks anticipate disruptions, reduce risk, and work more efficiently. Key areas for integration include:

- **Credit risk management:** Physical climate risks directly impact creditworthiness. Banks can integrate findings from PCRA (Section 1.2) and client engagement (Section 3.2) into credit policies and assessment processes. This may involve:
  - **Policy updates**: Updating credit policies to include checks for physical climate risks as part of risk ratings and due diligence processes.
  - **Process integration**: Checking how physical climate risk affects repayment ability; adjusting collateral valuation based on risk and resilience levels; and potentially defining specific A&R exposure limits within the risk appetite policy. These limits might cap total financing in high-risk flood zones for instance, or for assets below certain resilience standards.
- **Client due diligence:** Client due diligence can be enhanced by checking for climate risk exposure, the client's current resilience efforts, and potential maladaptation, especially for high-risk clients or geographic areas. This involves updating KYC and due diligence policies. Such checks help gather initial data and identify clients that may require more in-depth A&R discussions.
- **Product development and approval:** Ensure new product approval processes (Section 3.1) align with the bank's A&R strategy and relevant standards/taxonomies. This ensures 'A&R-labelled' products are credible.
- **Operations:** Review the climate resilience of the bank's own operations, buildings, and key suppliers. Update procurement policies, supplier selection criteria, and business continuity plans to better handle climate disruptions affecting the bank directly.
- **Other policies:** Depending on the bank's structure and focus, further integration might also involve Environmental and Social policies (e.g., ensuring alignment on maladaptation criteria or related environmental objectives) or HR policies. HR policy integration might relate to specific A&R training (see Section 3.3.3) or, for leading practice, incorporating A&R responsibilities into performance management or incentives for relevant roles.

3.3.2 Data management for effective A&R integration

Robust data and data management systems are important for effective A&R integration, supporting risk assessments (Section 1.2), client engagement (Section 3.2), portfolio management (Section 3.1), and monitoring (Section 1.3). As a starting point, banks can use existing public climate data and add basic A&R-related questions to conduct due diligence. Resources from UNEP FI[11] and other industry-recognized sources can help identify external data providers to support bank activity in this area. Key challenges are managing data quality, consistency, and comparability from different sources.

Effective data management also involves:

- Clear data governance (e.g., defining who owns the data, processes for quality checks, and how often it is updated).
- Developing strategies to manage incomplete or inconsistent data (which is a common issue for both climate projections and client-reported information).
- Bringing different data types together (e.g., geospatial, climate science, client, financial data) on suitable platforms, potentially leveraging sector-wide data initiatives where available. This can be complex and may call for investment over time in IT systems and analytical skills for advanced A&R work.
- Clearly documenting data sources, methods used, assumptions made, and any limitations (important for both internal checks and external reporting).

Banks can take a phased approach, starting with key data for priority risks and building more advanced systems over time. Integrating and centralising climate and financial data can significantly improve analysis and decision-making, which helps with risk pricing, identifying opportunities, scenario analysis, and reporting. The specific data needed will also depend on the bank's strategy: portfolio-level approaches generally use more aggregated data, while counterparty-specific approaches depend on granular client details. Practical implementation also involves addressing data formatting and standardization challenges so that information can be effectively integrated into bank systems.

3.3.3 Building internal capacity and culture

Successfully implementing A&R depends on internal capacity and a culture that supports climate resilience. Internal awareness campaigns are a good start, but further capacity development requires strong and sustained leadership support. Visible commitment and clear, continued communication from senior leaders are key to building this culture.

Building practical A&R capacity involves targeted actions:

- Develop role-specific training to equip staff with needed A&R skills (e.g., RMs on client engagement and solution spotting; credit analysts on PCRA integration; risk managers on modelling; product teams on A&R product design). Foundational courses can also provide all relevant staff with core A&R knowledge.
- Share knowledge by creating internal hubs, such as intranet sites, and networks (e.g., 'climate champions'). These platforms allow staff to learn from each other, share best practices, and access support.

11 UNEP's annual Climate Risk Landscape report and supporting database may support banking practitioners in identifying physical climate risk approaches and providers.

- Update procedures, workflows, and committee mandates to include A&R considerations.
- Reinforce action by linking performance management, and potentially incentives (especially for leading practice), with A&R objectives. This encourages desired actions and accountability.

Ultimately, building a proactive A&R culture depends on ongoing leadership engagement. This helps ensure climate resilience becomes part of the bank's core strategy, reflecting a genuine commitment throughout the institution around A&R action and outcomes..

3.3.4 Fostering stakeholder engagement and partnerships

Engaging effectively with stakeholders beyond direct clients is key for successful A&R and builds support. Climate change is a systemic issue, requiring collaboration, transparency, and open dialogue.

Working with investors, regulators, policymakers, peers, experts, and communities can help banks to: understand evolving needs and expectations; help shape supportive policies and regulations; keep the bank's A&R strategy relevant; and promote wider market resilience. This engagement often focuses on sharing insights, identifying collaborative opportunities, and helping build markets for resilience.

Banks can work with key stakeholder groups as follows:

Table 5: Illustrative engagements with stakeholders

Investors	Managing relationships with the bank's capital providers. Includes reporting A&R performance, discussing strategy alignment with investor expectations, and potentially exploring A&R-themed funding.
Regulators	Proactive dialogue helps banks understand supervisors' views on physical climate risk and share practical insights as guidance evolves.
Industry peers	Working with peers via associations/forums allows sharing best practices, tackling common problems (like data gaps), and potentially developing joint standards.
Local communities and technical experts	Partnerships can provide local context and data (for PCRA), opportunities to support community projects, or access to specialized knowledge (e.g., for NbS).
DFIs, Multilateral Development Banks, and Climate Funds	Working with DFIs, MDBs or Funds on blended finance (Section 3.1.4), market insights, co-financing, and technical assistance can scale up A&R finance, particularly in developing countries.
Policymakers	Engaging through policy advocacy (e.g., by providing practical, evidence-based insights on financing challenges/opportunities and enabling conditions), aligned with the bank's strategy (Section 2.1), helps foster supportive regulatory frameworks and public investment needed for adaptation. This can be done through collaborative industry platforms or direct dialogue.

Insurers and Reinsurers	Collaborating on new products (see 3.4.2), sharing data where appropriate, understanding insurance market signals, and potentially joint client or policy engagement.

For an illustrative progressive approach to enhancing these internal A&R foundations, see Box 9.

Box 9: Illustrative progressive approach for enhancing internal policies, processes, and culture

Getting started

Intended outcome: The bank builds initial internal A&R awareness, identifies relevant existing data, and begins learning from external peers and resources.

- Conduct short internal A&R awareness campaigns for relevant teams.
- Identify existing internal data sources that could support initial A&R assessment and understanding (e.g., client data for PCRA, basic portfolio information).
- Join relevant industry forums or working groups for initial A&R learning and peer insights.
- Begin an informal review of key bank policies to identify potential A&R integration points.

Responsible practice

Intended outcome: The bank operationalizes A&R within key processes, supported by tailored staff training, initial A&R data governance, and targeted policy amendments, and begins to articulate its A&R approach externally.

- Incorporate PCRA in originations as part of due diligence process.
- Develop and deliver role-specific A&R training for key staff (e.g., RMs, risk analysts, product teams).
- Establish basic data management protocols for A&R-related information (e.g., collection, storage, quality checks).
- Provide basic qualitative external disclosures on A&R approach.
- Update targeted key policies (e.g., credit risk, E&S) to formally incorporate A&R considerations.

Leading practice

Intended outcome: The bank fully embeds A&R across all relevant policies, processes, and decision-making, supported by robust data systems and analytics, and a deeply ingrained, proactive A&R culture.

- Fully integrate A&R considerations into all relevant policies/processes (e.g., credit, procurement, product approval, HR).
- Implement and utilize robust IT and data systems for advanced A&R risk management and monitoring.
- Cultivate a strong, bank-wide A&R culture through leadership commitment, active 'climate champions', and clear governance endorsement.
- Develop internal knowledge management systems and expertise to effectively support and leverage strategic external A&R partnerships and advocacy.

3.4 External disclosures and stakeholder transparency

External disclosures support stakeholder engagement by providing transparency and accountability on the bank's A&R strategy, actions, and performance. Unlike internal reporting (Section 2.2.5), external disclosures target an outside audience and often follow regulatory or investor expectations.

Disclosure requirements vary by jurisdiction, but common frameworks exist and are widely used. The framework developed by the Task Force on Climate-related Financial Disclosures (TCFD) is now fully incorporated into the IFRS S2 Climate-related Disclosures, and has significantly shaped approaches to climate reporting worldwide. Banks can use IFRS S2 and local rules to guide reporting, including decisions on what A&R information is material. To continuously improve the utility of their disclosures, some banks engage with stakeholders to gather feedback on their A&R reporting. Other frameworks also exist (see Table 6). The trend is towards integrated reporting, including A&R within wider climate/transition disclosures. While full comparability for A&R disclosures is complex due to its context-specificity, aligning with recognized frameworks is a step towards enabling more meaningful comparison by stakeholders.

Banks may also reference other relevant frameworks or standards, voluntary and mandatory, for reporting structure and content:

Table 6: Illustrative disclosure standards relevant to A&R

Standard	Standard description	A&R relevance
ISSB (IFRS S2 Climate)	Global baseline standard for climate-related financial disclosures.	Requires disclosure on climate governance, strategy (including resilience), risk management, metrics and targets (incl. A&R)
TCFD (Basis for IFRS S2)	Widely adopted recommendations covering governance, strategy, risk management, metrics and targets.	Explicitly includes physical climate risk assessment, adaptation plans, resilience strategy.
CDP (formerly Carbon Disclosure Project)	Global reporting system for environmental data (climate, water, forests).	Questionnaire includes sections on climate risks, opportunities, adaptation, and water security.
GRI (Global Reporting Initiative)	Widely used standards for broader sustainability reporting (ESG).	Can be used to report on climate impacts, adaptation measures, community resilience, environmental management.
DJSI (Dow Jones Sustainability Indices)	Family of indices tracking leading companies on ESG performance, based on Corporate Sustainability Assessment (CSA).	CSA assesses corporate climate strategy, risk management, adaptation actions, and resilience. Inclusion in DSJI signals leadership to investors.
Jurisdictional Rules (e.g., EU CSRD)	Specific mandatory reporting requirements within certain regions (e.g., EU Corporate Sustainability Reporting Directive (CSRD) requires ESRS standards).	Often built on TCFD/ISSB but may have specific requirements regarding physical climate risk, adaptation, and Do No Significant Harm (DNSH) (e.g., ESRS E1).
Transition Plan Frameworks (e.g., UK TPT, now overseen by ISSB)	Guidance for developing and disclosing climate transition plans.	Explicitly call for consideration of climate-related risks (incl. physical), integration of adaptation actions supporting the overall strategy, and potential trade-offs or synergies.

Banks must, first and foremost, comply with all applicable legal and regulatory disclosure requirements in their respective jurisdictions. The progressive approach outlined in Box 10 offers supplementary guidance on enhancing transparency regarding their A&R approach, risks, and performance, building towards alignment with international best practices where appropriate and material.

Box 10: Illustrative progressive approach for external disclosures and stakeholder transparency

Getting started

Intended outcome: The bank provides initial, basic qualitative statements about its A&R awareness and approach in existing external reports.

- Include brief, qualitative mentions of A&R awareness or initial approach within existing sustainability or annual reports.
- Familiarize relevant staff with common A&R disclosure frameworks (e.g., TCFD basics).
- Conduct an initial assessment to determine A&R information potentially material for disclosure.

Responsible practice

Intended outcome: The bank implements structured qualitative A&R disclosures, typically guided by TCFD pillars, and begins to report initial, relevant A&R metrics.

- Develop structured qualitative disclosures on A&R governance, strategy, and risk management approach (e.g., following TCFD recommendations).
- Identify and report initial, high-level A&R-related metrics where data is reliable (e.g., % portfolio screened, A&R training reach).
- Clearly designate where A&R information can be found within public reports.

Leading practice

Intended outcome: The bank provides comprehensive, integrated A&R disclosures aligned with international standards (e.g., IFRS S2), including quantitative metrics, targets, and scenario analysis insights.

- Align A&R disclosures fully with leading international standards (e.g., full IFRS S2 Climate implementation).
- Disclose relevant quantitative A&R metrics, any public A&R targets (practice and impact), and progress towards them.
- Report on the resilience of the bank's strategy using climate-related scenario analysis, including physical climate risk considerations.
- Integrate material A&R disclosures into mainstream financial reports where appropriate.
- Explain methodologies used for key A&R assessments, metrics, and scenario analysis.
- Consider external assurance for key A&R reporting.

3.5 Interplay with the insurance sector: Risks and opportunities

Whether clients can get affordable insurance for climate risks deeply affects both them and the banks that lend to them. Understanding this link helps banks manage risks and identify opportunities to support clients.

3.5.1 Insurance as a risk signal and factor in client viability

The insurance market gives important signals about physical climate risk and directly affects a client's adaptive capacity:

- **Risk signal:** Trends in insurance premiums for climate-exposed properties or operations (e.g., rising premiums, higher deductibles, reduced coverage limits) act as market-based signals of escalating perceived risk. Outright withdrawal of coverage in high-risk areas ('insurance deserts') is an even stronger signal. Banks can monitor these trends (see Section 1.1.2) as early warnings of financial stress.
- **Client adaptive capacity:** Access to good, affordable insurance is key to a client's adaptive capacity, as it acts as a financial cushion. A lack of insurance, or insufficient coverage, can make clients more vulnerable, slow their recovery after climate-related events, and increases the risk that they cannot repay loans.
- **Incentivizing (or discouraging) adaptation:** Incentivizing (or discouraging) adaptation: Conventional insurance terms (such as discounts for flood-proofing) can encourage clients to adapt. The availability of innovative solutions like parametric insurance (which pays out based on pre-defined event triggers rather than assessed losses) can also influence investment and A&R decisions in high-risk areas. Conversely, if suitable insurance is generally unavailable or unaffordable, it can deter investment and A&R, potentially lowering property values or creating stranded assets.

3.5.2 Implications for banks

The state of the insurance market directly affects banks through:

- **Credit risk:**
  - Uninsured climate losses—from direct damage or resulting business/revenue disruption—can directly harm a client's ability to repay loans, raising the risk of non-performing loans (NPLs).
  - A lack of insurance can also lower the value recovered from collateral (such as property) after a climate event, increasing the bank's potential loss given default (LGD).
- **Collateral valuation and risk appetite:** Banks can consider if assets used as collateral can be insured now, and in the future, especially for long-term loans in exposed areas. If a property becomes uninsurable, its market value and ability to sell could drop sharply. This affects LTV ratios (Section 1.2) and can inform the bank's risk appetite and strategy.

Therefore, banks can consider adding insurance checks into their processes as follows:

- **Screening:** Check a client's current insurance during due diligence or loan screening, especially for high-risk areas. This includes verifying perils covered, coverage for property damage and business or revenue disruption) and coverage limits, deductibles, insurer rating, and renewal terms.
- **Client engagement:** Discuss insurance with clients (Section 3.2), including challenges they face, the risks of being underinsured, and how adaptation might improve insurability or lower costs.
- **Loan covenants:** Consider provisions requiring borrowers to maintain adequate insurance for relevant climate perils, where available and commercially viable (this calls for careful legal evaluation for appropriateness and enforceability in specific contexts or jurisdictions).
- **Partnerships:** Explore partnerships with insurers to help clients access, potentially bundled with resilience finance (while ensuring consumer protection).
- **Data and analytics sharing:** Explore opportunities to share non-sensitive climate risk data/analytics with insurers. This can help improve risk assessment and product design (respecting privacy and commercial rules).

A good understanding of, and collaboration with, the insurance sector helps banks manage their own risks and better support client resilience in the face of growing climate impacts.

Box 11 illustrates how banks can progressively engage with the insurance sector on A&R.

Box 11: Illustrative progressive approach for engaging with the insurance sector

Getting started

Intended outcome: The bank develops internal awareness of insurance and A&R interlock, and how insurance market trends and client coverage may inform A&R strategy and action.

- Monitor general insurance market trends (e.g., availability, cost) in key markets or sectors.
- Ask basic questions about current insurance coverage during client due diligence for high-risk geographies and/or sectors (as relevant).

Responsible practice

Intended outcome: The bank monitors insurance market activity, engages clients to discuss insurance as part of A&R strategy, and incorporates insurability within risk assessment and lending strategies.

- Systematically track insurance premium trends and coverage availability for relevant client segments or portfolios.
- Discuss insurance challenges and the benefits of adaptation with clients during A&R engagements.
- Consider basic loan covenants for maintaining adequate climate-related insurance, where feasible and legally sound.
- Analyse how changes in client insurability could impact the bank's own credit risk and collateral values.

Leading practice

Intended outcome: The bank proactively collaborates with the insurance sector to enhance client access to A&R-aligned insurance solutions, develop innovative products, and integrates future insurability into its core risk and valuation frameworks.

- Integrate assessments of future client/asset insurability into long-term risk appetite, credit risk, and collateral valuation.
- Forge partnerships with insurers to improve client access to insurance and to co-develop innovative A&R solutions (e.g., parametric insurance, finance-insurance bundles).
- Participate in responsible data and analytics sharing initiatives with insurers to improve collective risk understanding.
- Engage with policymakers and/or industry bodies, potentially alongside insurers, on systemic issues of climate risk insurability and market stability.

4. Continuous improvement

Continuous improvement is the overarching principle ensuring the bank's A&R approach stays effective and responsive over time. It involves actively learning from monitoring (Section 1.3) and operational experience (Section 3) to refine the Assessment, Strategy, And Action cornerstones. Through this iterative process, the bank can better manage risks, capitalize on resilience opportunities, and foster innovation in its A&R products, services, or engagement approaches. This section outlines how this feedback cycle links the core components.

Insights gathered from monitoring (Section 1.3) and practical implementation experience (Section 3) are crucial inputs for this learning cycle. Table 7 below illustrates the dynamic interplay driven by this feedback, showing how learning links and refines the different A&R components:

Table 7: The A&R feedback loop: Linking components through learning

Interaction	Explanation	Example
Monitoring informs Assessment	Monitoring data (e.g., on risks, client progress, solution results) updates the bank's understanding of the A&R landscape.	Monitoring might demonstrate faster impacts or effective solutions, triggering a review of risks/ opportunities (Sections 1.1, 1.2).
Assessment refines Strategy	New understanding helps the bank adjust its strategy.	This could involve refining strategic priorities (Section 2.1), modifying risk appetite (Section 2.1), or updating A&R targets (Section 2.3).
Strategy drives future Actions	Updated strategy guides next implementation steps and the ambition for action.	This may lead to adapting products (Section 3.1), evolving client engagement (Section 3.2), enhancing internal processes further (Section 3.3) or refining the ambition of A&R targets (e.g., moving from practice towards impact targets, as discussed in Section 2.3).

To ensure the bank's A&R approach remains effective and continues to evolve, it is helpful to establish clear processes for this feedback loop. These can include regular performance reviews using monitoring data, risk assessment updates based on new insights, and formal cycles for refreshing the strategy. Clear communication and defined responsibilities between the relevant teams (see Section 2.2 and Table 3) are also key to making this feedback loop work well. Governance bodies (as outlined in Section 2.2) play a vital role in overseeing this continuous improvement cycle, reviewing its findings, approving any significant strategic adjustments that arise, and ensuring accountability for learning and evolving the A&R approach.

Navigating the A&R journey successfully means going beyond building capability to integrate A&R across all areas and integrating wider sustainability goals (including mitigation, nature, and social considerations). By adopting such a forward-looking and integrated approach, banks can effectively manage risks, seize A&R-related opportunities, and make meaningful contributions to a climate-resilient future. Box 12 shows practical steps banks can take to embed continuous improvement and adapt their A&R approaches through a progressive model.

Box 12: Illustrative progressive model for continuous improvement and adapting A&R approaches

Getting started

Intended outcome: The bank begins to learn from its initial A&R activities through informal reviews, enabling basic, early adjustments.

- Conduct informal reviews of early A&R monitoring results and operational experiences.
- Identify key early lessons and make minor, immediate adjustments to A&R activities as needed.

Responsible practice

Intended outcome: The bank implements a formal monitoring mechanism to review A&R performance, using insights generated to update its assessments, strategy, and actions.

- Implement a systematic process for collecting and reviewing A&R performance data results and operational feedback.
- Utilize insights to inform A&R strategy, target and action revision as required.
- Document key learnings and decisions from the A&R review process.

Leading practice

Intended outcome: The bank strengthens monitoring mechanisms to evaluate A&R performance, dynamically adapting bank approaches (as required), and advancing collective industry practice.

- Continuously evaluate A&R effectiveness and dynamically adapt bank approach (strategy, targets, products, processes) as required.
- Share A&R knowledge, lessons learned, and successful methodologies externally to contribute to wider industry advancement.
- Implement integrated systems for A&R learning and actively scan for emerging risks, opportunities, and best practices.
- Embed a strong culture of A&R continuous improvement and adaptation across relevant parts of the bank.

Annexes

To further support the practical application of this guidance, the Annexes provide supplementary details, illustrative examples, and relevant resources for practitioners. These include:

- Annex A: Policy case studies and their implications for bank A&R.
- Annex B: Sector-specific considerations for real estate and agriculture.
- Annex C: Illustrative worked examples of A&R activities.
- Annex D: A compilation of relevant A&R frameworks and tools.

Annex A: Policy context—case study details

This Annex offers further details on selected examples of national, sub-national, sectoral, and cross-cutting policy initiatives related to A&R. These examples were selected to illustrate the diversity of policy approaches relevant to banks, covering different geographic scales, policy types, and key implications (risk assessment, opportunity identification, engagement strategies, reporting). They provide context for the discussion in Section 1.

A.1. NAPs: Contextualising risk and anticipating change (Kenya)

Policy context: Kenya's NAP identifies the country, particularly its dominant agricultural sector, as highly vulnerable to climate impacts such as drought and water stress.

Key A&R features: Outlines government priorities and planned investments in water resource management, irrigation, and adaptation in Arid and Semi-Arid Lands (ASALs).

Implications for banks: Provides crucial **risk context** for agricultural portfolios (drought and water stress); signals **future changes** based on planned interventions; enables better portfolio segmentation and **client prioritization**.

Potential bank actions/use cases

- **Risk assessment:** Input NAP vulnerability data (sector or region focus) into portfolio screening (PCRA) to identify high-risk clients in the agriculture sector.
- **Opportunity identification:** Align product development/marketing with NAP priorities (e.g., financing water-efficient irrigation).
- **Client engagement:** Use NAP context (shared national challenges and priorities) to frame conversations with agriculture sector clients about risks and relevant financing solutions.

A.2. NAPs: Signalling innovation needs (Vietnam)

Policy context: Vietnam's NAP identifies significant vulnerabilities (e.g., agriculture, coastal infrastructure—saline intrusion) and emphasizes the need for A&R.

Key A&R features: Calls for climate-resilient agriculture (e.g., salt-tolerant crops) and infrastructure (e.g., coastal defences); explicitly encourages **innovative financing mechanisms** and new financial products and services.

Implications for banks: Directly signals **market opportunities** for financing resilient practices or infrastructure; provides strategic justification for **product innovation**; indicates government openness to **partnerships** on finance solutions.

Potential bank actions or use cases

- **Product development:** Develop tailored loan products (potentially with technical assistance) for climate-resilient agriculture or explore green and blue bonds for coastal defence projects.
- **Opportunity analysis:** Assess financing needs for salt-tolerant crops or other NAP-highlighted resilient solutions within the bank's portfolio, or target market.
- **Partnerships:** Engage with government and development partners on designing or implementing innovative financing mechanisms called for in the NAP.

A.3. NAPs: Identifying financing mechanisms (Bangladesh)

Policy context: Bangladesh's NAP reflects high national vulnerability and identifies a significant investment need (USD 230 billion by 2050) across multiple sectors.

Key A&R features: Emphasizes mobilizing **private finance**; identifies potential mechanisms (blended finance, green bonds, fiscal incentives); builds on existing domestic funds (e.g., Bangladesh Climate Change Trust Fund (BCCTF)) and international support channels (e.g., Bangladesh Climate Change Resilience Fund (BCCRF)).

Implications for banks: Clearly signals the **scale of financing opportunities**; provides concrete examples of **financing mechanisms** to explore; points to existing **funding structures** (domestic and international) for potential partnerships or co-financing.

Potential bank actions or use cases

- **Strategic planning:** Use the quantified investment need to assess market size for A&R finance in key sectors.
- **Product or deal structuring:** Explore participation in blended finance deals or issuance and underwriting of green bonds aligned with NAP priorities.
- **Partnerships:** Investigate collaboration opportunities like the Bangladesh Climate Development Partnership (BCDP), or with existing funds (BCCTF, BCCRF) on specific financing initiatives.

A.4. National collaboration model: Sustainable Finance Platform (Netherlands)

Policy context: The Dutch Central Bank (DNB) has established an Adaptation Working Group under its Sustainable Finance Platform, bringing together financial sector actors (banks, insurers, pensions), government, regulators, and academics.

Key A&R features: Focuses on understanding and addressing physical climate risks; examines necessary data, methodologies (scenario analysis), financing and insurance solutions; conducts pilot projects (e.g., real estate foundation issues, mortgage adaptation options).

Implications for banks: Provides direct **access to regulators and peers**; fosters a **shared understanding** and common approaches (potentially reducing costs); creates a coordinated voice on finance challenges and opportunities; offers insights into **emerging risks and solutions** from pilot projects.

Potential bank actions or use cases

- **Engagement and learning:** Actively participate in platform working groups to share bank perspectives, learn from peers and experts, and understand supervisory expectations.
- **Methodology adoption:** Leverage methodologies or data insights developed and shared via the platform for internal risk assessment or strategy development.
- **Inform strategy:** Use insights from platform discussions and pilot projects (e.g., on mortgage risks) to inform bank's own A&R strategy and product development priorities.

A.5. Sub-national plans: Granularity for local risk and action (New York City stormwater)

Policy context: The NYC Stormwater Resiliency Plan (2021) provides highly localized assessment of current and future extreme rainfall flood risk and proposes concrete green or grey infrastructure strategies.

Key A&R features: Identifies specific neighbourhood vulnerabilities; prioritizes green infrastructure investment (bioswales, permeable pavements); includes mandatory building-level stormwater upgrades for new developments; promotes best practices for existing buildings; backed by significant committed funding.

Implications for banks: Provides **critical, geographically specific data** for PCRA (identifying high and low risk zones for CRE and RRE); signals **regulatory drivers** (mandatory upgrades); highlights significant **public-private financing opportunities** related to plan implementation (public projects, private retrofits).

Potential bank actions or use cases

- **PCRA:** Use granular flood risk maps to refine PCRA for CRE and RRE portfolios located in NYC.
- **Opportunity identification:** Target financing for property owners undertaking mandatory upgrades or voluntary green infrastructure retrofits incentivized by the plan.
- **Client dialogue:** Discuss location-specific risks identified in the plan and potential financing solutions with NYC-based clients.

Annex B: Sector contexts and business cases

This Annex offers further context on applying climate Adaptation and Resilience (A&R) principles within key sectors, complementing the methodologies in the main guidance (Sections 1–4). For Commercial Real Estate, Residential Real Estate, and Agriculture and Food, it outlines practical points banks could consider at each stage of the implementation journey: Assessment, Strategy, and Action. The aim is to provide colour on how A&R approaches might be tailored, acknowledging the unique characteristics of each sector.

B.1. Commercial real estate

CRE involves diverse, often high-value, long-lifespan assets where climate impacts can manifest over decades. Tenant operations and building performance (energy and water use) are significant factors. Addressing A&R can help protect long-term asset value, manage operating costs, meet evolving expectations, and identify opportunities in resilient properties.

Key hazards often considered: flood (coastal, inland, pluvial), extreme heat, extreme weather, water stress, wildfires.

Considerations for Assessment (Section 1)

Beyond the physical structure, what else influences risk?

Consider assessing **tenant viability and resilience.** Climate disruptions affecting tenants' businesses (e.g., supply chain interruptions, operational downtime during heatwaves) could impact their ability to pay rent, influencing income streams and property value. Examining the resilience of building operations to disruptions in **local infrastructure** (energy, water, transport) (Mühlhofer *et al.*, 2024) may also provide valuable insights.

How might building specifics affect vulnerability?

The **operational sensitivity** of a building, particularly to **extreme heat,** can drive significant cooling costs (Miranda *et al.*, 2023) and potentially strain HVAC systems. Furthermore, **building standards and age** play a role; older properties might lack modern resilience features or face higher costs to meet future energy efficiency regulations.

What data could inform the assessment?

Gathering granular building-level data on **energy performance, water usage, construction materials, and lease structures** can enhance the assessment. Publicly available **green**

building certifications might offer some indicators, although they may not cover all physical climate risks. Contextual data, such as **water stress** in key investment regions (Blackrock, 2020), could also be relevant. (Annex D suggests potential data resources).

What external trends are worth monitoring?

Keeping track of **evolving building performance standards and disclosure requirements** can highlight potential transition risks and market drivers for A&R retrofits. Monitoring **insurance market trends** for CRE in high-risk areas (premiums, coverage availability) provides signals regarding long-term asset financeability and value.

Considerations for Strategy (Section 2)

How might CRE characteristics influence risk appetite?

The long-term nature of CRE assets introduces the possibility of **"stranded asset" risk**—properties losing value due to climate impacts or obsolescence. Banks might consider their tolerance for financing assets facing significant **insurance challenges** or lacking basic resilience features in high-hazard areas. Addressing potential **portfolio concentration risk** in hazard-prone geographies is another consideration.

Where might financing opportunities lie?

A substantial market exists for financing **energy efficiency and climate resilience retrofits** in existing buildings. There are also opportunities in supporting **new CRE developments** designed from the outset for high resilience and environmental performance.

What could targets focus on?

Targets could potentially relate to **improving the average resilience or efficiency profile** of the financed CRE portfolio, tracking financing volumes for **certified green or resilient buildings**, or monitoring engagement with owners of properties identified as having higher risk profiles.

Considerations for Action (Section 3)

How could financial products be adapted?

Financing solutions could be tailored for **A&R retrofits**, potentially linking terms to achieving recognized performance improvements or certifications. Structures like **staged loan disbursements** might suit larger retrofit projects. (See Section 3.1.3 on Developing Products).

What approach could client engagement take?

Conversations with CRE owners/operators could focus on **reducing operational costs, enhancing tenant attraction** (especially those with ESG goals), meeting regulations, and protecting asset value. Sharing insights on **resilience technologies and potential ROI** may be helpful. Engaging via industry bodies could also be effective. (See Section 3.2 for Engagement approaches).

What internal adjustments might be useful?

Equipping banking teams with knowledge of **CRE-specific topics** (e.g., building science, green standards, energy codes) can support effective implementation. Over time, banks might consider adapting **property valuation methodologies** and **credit underwriting processes** to better reflect A&R factors. (See Section 3.3 on Internal Enhancements).

Detailed list of hazards with references:

Table 8: Overview of climate hazards relevant to CRE

Hazard	Hazard overview
Sea level rise and coastal flooding	Storm surges and tidal flooding, coupled with sea level rise are a risk to coastal CRE. Estimates show that, without adaptation, the population exposed to coastal flooding will increase by 52% by the end of the century (Kirezci *et al.*, 2020). These risks are existential for Small Island Developing States (SIDS): future damages increase up to 14 x—could lead to forced migration (Vousdoukas *et al.*, 2023).
Inland flooding	Inland flooding (fluvial and pluvial) represents the largest proportion of flood exposure globally >90%. Urbanization (Rentschler *et al.*, 2023) both increases exposure and reduces soil permeability, increasing risk. Over 2 million kilometres of urban roads are exposed to inland flooding, which can pose a significant indirect risk to CRE (World Bank, 2022).
Extreme storms and wind	Increased intensity and frequency of tropical storms, such as hurricanes, cyclones, and typhoons. These storms can cause direct damages to assets due to extreme wind speeds. They also pose a significant indirect risk to power networks (Hall *et al.*, 2024) that can increase those impacted by several orders of magnitude (Mühlhofer *et al.*, 2024).
Wildfires	Between 2005–2020, wildfires destroyed ~90,000 structures in the United States (Barrett, 2020). Globally, extreme wildfire occurrence has increased 2.2-fold over the last 20 years due to warming (Cunningham *et al.*, 2024). There are also indirect impacts, as evidenced in the US east coast in 2023, where wildfire smoke caused economic disruption.
Subsidence	Subsidence—which occurs when the ground beneath a property sinks, pulling the foundations of a property down and causing the walls and floors to shift—has the potential to destabilize the structure of a property. Subsidence is made worse by both climate change and human activity. Coastal cities face a double threat of subsidence and sea level rise (Nicholls *et al.*, 2021).
Heat and water stress	About 60% of global real estate investment trusts are located in areas such as Malaysia, the Philippines, Japan, Hong Kong, and Australia, which are expected to experience high water stress by 2030. Extreme heat will increase global cooling demand, particularly in India, Africa and countries traditionally unprepared for heat (Miranda *et al.*, 2023).

B.2. Residential real estate

Impacts on RRE directly affects homeowners' financial security and well-being. A notable feature can be **"unpriced" climate risk,** where property values may not fully reflect hazards like floods or wildfires. Coupled with potential **insurance affordability and availability challenges,** this creates risks for homeowners and bank collateral. A&R efforts often focus on protecting homeowners, safeguarding collateral value, and financing resilience improvements.

Key Hazards often considered: Flood (Coastal, Inland, Pluvial), Extreme Weather, Wildfire, Extreme Heat, Subsidence.

Considerations for Assessment (Section 1)

What makes homeowner vulnerability distinct?

Consider assessing **homeowner adaptive capacity,** particularly **affordability.** Can homeowners realistically afford resilience upgrades or rising insurance costs? Can they absorb costs from uninsured damage (Thomson et al., 2023)? Financial constraints can be a major barrier to adaptation and increase default risk. (See Section 1.2.1 on Vulnerability).

Could property values hide climate risks?

Banks may wish to consider potential **property overvaluation** due to unpriced climate risk, especially flood exposure (Gourevitch *et al.*, 2023). The collateral securing a loan might hold less actual value than perceived, particularly as climate impacts increase.

Beyond the single property, what factors matter?

Evaluating **neighbourhood-level dynamics** is informative—is insurance becoming difficult to obtain or afford *in the area*? how resilient is local infrastructure? These broader factors influence individual property risk and marketability.

What specific data points are helpful?

Gathering property-level information on **flood zones, wildfire risk scores, construction type, and current insurance coverage** (perils, limits, premiums) aids assessment. Public risk maps offer a starting point, though more granular, forward-looking data is preferable when available. (Annex D suggests potential data resources).

What market and policy signals should be watched?

Monitoring **insurance market shifts** in high-risk regions (premium hikes, coverage reductions, insurer exits) (Bloomberg, 2024; Bradley, 2024) is advisable. Insurance withdrawal can impact mortgageability and property values. (Canadian Underwriter, 2024; Insurance Business, 2024). Also track relevant **government incentive programs** for home resilience.

Considerations for Strategy (Section 2)

How might valuation and insurance risks influence risk appetite?

Strategy development could explicitly address risks from **potential property overvaluation** and **declining insurability.** Banks might consider approaches like **climate-informed Loan-to-Value (LTV) assessments** or specific underwriting criteria for properties in high-risk zones facing insurance challenges. Defining approaches for managing existing exposure in such areas is also relevant. (See Section 2.1).

Where are the financing opportunities in RRE resilience?

A key area is financing **verifiable home resilience upgrades** (e.g., flood-proofing, fire-hardening) that demonstrably reduce physical climate risk and potentially improve insurability or maintain value. Exploring partnerships with community resilience programs could yield further opportunities.

What could targets look like for RRE?

Targets might involve **financing volumes for verified resilience upgrades**, the number of homeowners supported with finance/advice in high-risk areas, or perhaps metrics confirming adequate insurance is maintained within the portfolio. (See Section 2.3).

Considerations for Action (Section 3)

How could financial products support homeowners?

Developing **accessible loan products** for resilience upgrades, possibly with **incentivized terms** reflecting reduced risk (like the example in Annex C.4), could be effective. Smaller, unsecured loans for specific measures might also meet homeowner needs. Where appropriate, **confirming adequate hazard insurance** could be integrated into financing conditions. (See Section 3.1.3).

What makes for effective homeowner engagement?

Clear, empathetic communication is helpful, focusing on homeowner concerns: safety, protecting their investment, managing costs, and understanding local risks simply. Proactively addressing **common barriers** like upfront cost or complexity can improve uptake. Partnering with trusted local entities (e.g., builders, community groups) can enhance effectiveness. (See Section 3.2 and Annex C.6).

What internal adjustments could support RRE resilience?

Training frontline staff to **discuss climate risks and resilience options sensitively** is beneficial. Equipping underwriters and appraisers to understand how climate factors impact property value and risk is also important. Adapting **property appraisal processes** over time to better incorporate climate risk and resilience features could be considered. (See Section 3.3).

Table 9: Overview of climate hazards relevant to RRE

Hazard	Hazard overview
Sea level rise and coastal flooding	~40% of US population lives in coastal communities, and nearly 2.5 million properties (worth USD 1.07 trillion) will be at risk by 2100 (Union of Concerned Scientists, 2018). Annual coastal flood losses in Europe are EUR 1.4 billion per year today but could risk to EUR 209.8 billion by the end of the century without further adaptation (Vousdoukas *et al.*, 2020).
Inland flooding	Inland flooding is a significant risk to RRE because many homes are built (and continue to be built) in floodplains (Andreadis *et al.*, 2022). Research has shown that RRE flood risk is unpriced as it is not currently reflected in property values in the US (Gourevitch *et al.*, 2023).
Extreme storms and wind	Tropical cyclones (or hurricanes) typically form in global cyclone basins putting RRE located in these basins at risk. 22 million people were directly affected and damages of USD 29 billion on average per year over the last 20 years (Geiger *et al.*, 2018) tropical cyclones. Climate change is making cyclones more intense but less frequent (Knutson *et al.*, 2020).
Wildfires	Nearly 50 million homes are in wildfire-risk areas in the USA (Burke *et al.*, 2021). Areas that have historically seen very little fire damage are more likely to become affected (First Street Foundation, 202). In California, insurance rates have increased by as much as 400% and some insurers no longer offer wildfire coverage (Munich RE, 2024).
Subsidence	The British Geological Survey estimates that the number of buildings across Britain likely to suffer will increase from 3% in 1990 to 6.5% by 2030. On the east coast in the USA, 476,000 to 6.3 million properties are exposed to subsidence rates between 1 and 2 mm per year (Ohenhen *et al.*, 2024).
Landslides	Climate change is making rainfall-triggered landslides more likely. Each year on average, they kill 4,500 people and cause USD 20 billion in damages. Risks are highest in the tropics and in cities where urbanization is growing on steep, unstable slopes (Ozturk *et al.*, 2022).

B.3. Agriculture and food

The agriculture and food sector's **direct dependence on climate patterns and ecosystem services** makes it uniquely exposed. Climate change introduces **significant production volatility, supply chain risks, and challenges to farmer livelihoods and food security.** A&R efforts often involve managing climate-linked credit risk, financing the shift to resilient farming systems, supporting supply chain stability, and protecting land value.

Key hazards often considered: Drought, water stress or scarcity, extreme heat, flooding, extreme weather, changing pest or disease patterns, soil degradation, biodiversity loss impacts.

Considerations for Assessment (Section 1)

How far do the risks extend beyond the farm?

Assessments could extend beyond the farm gate to consider **supply chain interdependencies.** How reliant is the client on climate-vulnerable inputs or downstream processors/buyers? Disruptions here can impact the primary producer.

Why is water such a critical focus?

Evaluating **water dependency** is often a key consideration. Assess current and future water availability and cost, as **drought is a major driver of agricultural losses and loan defaults** (FAO, 2021; Wahab et al., 2023; World Bank, 2024).

How does ecosystem health link to financial risk?

Consider **ecosystem health** trends. Degrading soil health impacts yields over time, while biodiversity loss can affect pollination or natural pest control (IUCN, 2021), indirectly impacting financial performance.

Are there wider, systemic risks to consider?

Acknowledge the potential for **systemic and correlated risk.** Major weather events impacting large agricultural regions ("breadbaskets") can cause simultaneous financial stress across multiple clients in a portfolio and contribute to food price volatility (McKinsey, 2020; Gaupp *et al.*, 2020). (See Section 1.2).

What data approaches are useful in agriculture?

Obtaining farm-level data can be difficult. **Geospatial data (satellite imagery), weather modelling, and partnerships with agricultural advisors or agri-tech firms** can help bridge data gaps. Assessing the effectiveness of specific adaptation practices often requires specialized knowledge. (Annex D suggests potential data resources).

What market and policy factors should be tracked?

Monitoring **global commodity price trends** and their links to climate events is relevant. Keeping abreast of **national/regional policies** on water, subsidies, and sustainable agriculture incentives (including National Adaptation Plans) provides important context. Understanding the scope and limitations of **crop insurance** programs is also helpful.

Considerations for Strategy (Section 2)

How might climate volatility influence risk appetite?

Banks might define their tolerance for exposure to **regions facing severe water stress** or crops known to be highly sensitive to projected climate shifts. The potential for **correlated losses** across the portfolio could inform concentration limits for specific regions or commodities. (See Section 2.1).

Where are the key opportunities to finance resilience?

Focus financing on supporting the adoption of **climate-resilient practices and technologies:** water-efficient irrigation, drought- or heat-tolerant seeds, soil health practices (cover cropping, no-till), agroforestry, precision agriculture, improved storage. Explore needs within the **broader value chain** (e.g., resilient logistics, processing). Consider potential shifts in production zones.

What could agricultural A&R targets involve?

Targets could relate to **financing volumes for specific adaptation practices**, demonstrated improvements in **water-use efficiency** on financed farms, support for **farm diversification,** or participation in relevant sustainability schemes. (See Section 2.3).

Considerations for Action (Section 3)

How could financial products be tailored for farmers?

Developing **flexible loan products** aligned with agricultural cycles (e.g., seasonal repayments) and potentially offering **longer tenors** can support the transition to new, resilient practices. Linking loan terms to **adopting verified sustainable practices** or integrating with **weather-indexed insurance** are other possibilities. Addressing the finance gap, especially for smallholders, remains a consideration. (See Section 3.1).

What are effective ways to engage agricultural clients?

Conversations can focus on **managing yield volatility, improving resource efficiency** (saving on water, energy, inputs), accessing **technical support for adaptation,** enhancing market access, and ensuring long-term business health. **Partnering with agricultural extension services, co-ops, or input suppliers** can help deliver technical assistance alongside finance. (See Section 3.2 and 3.3.4).

What internal adjustments might support agricultural A&R?

Equipping relevant teams with understanding of **local farming systems, climate impacts on specific crops and livestock, common A&R practices, and water management issues** is beneficial. Adapting **collateral valuation** (primarily land) could involve considering long-term risks like soil degradation and water scarcity, alongside potential value added by resilience investments. (See Section 3.3).

Table 10: Overview of climate hazards relevant to agriculture

Hazard	Hazard overview
Drought	Drought reduces agricultural productivity and yield. The agriculture sector absorbs 82% of the total economic impact of drought. Models show that in a pessimistic scenario, maize, soybean and rice productivity could decrease globally by 24% by the end of the century, crops such as wheat see shifting productive regions (Jägermeyr et al , 2021).
Flooding	Extreme storms and flooding can reduce the production and quality of feed grains, pastures, and forage crops as well as exposing crops to heavy metals, chemicals, and other contaminants (FDA, 2022). Between 1982–2016, flooding accounted for agricultural production losses of USD 5.5 billion in the USA.

Extreme storms and wind	Agricultural land can become infertile due to vegetation loss and coastal erosion from storm surges, extreme winds, and saltwater intrusion (Ortiz *et al.*, 2023). In the USA., major hurricanes caused yield declines up to 6% on average (Bundy *et al.*, 2023). Storms can also have significant impacts on farm equipment and transport.
Wildfires	Wildfires can directly damage livestock, crops, and agricultural property and equipment. Agricultural land management also significantly alters fire regimes (Kabeshita *et al.*, 2023). Wildfires do not need to directly impact agricultural land to have an impact. In 2023, USA harvests were impacted by smoke from wildfires in Canada (The Guardian, 2023).
Extreme heat	Extreme heat can disrupt crop growth during key parts of the growing cycle and lead to livestock deaths. Increased severity and frequency of heatwaves impacts farm workers and reduce productivity of labour-intensive crops (Diaz *et al.*, 2023). Temperature can also impact food storage and transportation (Godde *et al.*, 2021).
Nature	Climate change increases the range of invasive species and can reduce crop and animal health, impacting agricultural systems which costs the global economy more than USD 70 billion (IUCN, 2021). Other nature-climate risks that pose a significant risk to agriculture include soil loss, water stress and pollination service-loss.

Annex C: Worked examples: PCRA, products, portfolio and engagement

This Annex provides practical, illustrative worked examples applying the concepts discussed in the main guidance (Sections 1–4). These hypothetical scenarios, often based on working group discussions, aim to demonstrate how banks might approach various aspects of implementing A&R in different contexts.

The examples deliberately go into a reasonable level of operational detail to illustrate the **practical steps, considerations, and potential outputs** involved in applying the guidance. Banks are not expected to replicate these examples exactly, as specific approaches will depend heavily on individual circumstances, portfolios, capabilities, and regulatory environments. Instead, banks should use these examples as:

- **Conceptual blueprints:** Understanding the logical flow and key decision points in different A&R processes.
- **Illustrative tools:** Seeing how concepts like PCRA, adaptive capacity assessment, resilience-adjusted LTV, or stakeholder engagement might be operationalized.
- **Points of reference:** Comparing their own developing practices against these illustrative approaches.
- **Training aids:** Helping internal teams understand the practical implications of the bank's A&R strategy.

Readers can focus on the examples most relevant to their role or current area of focus, using the introductory table below and cross-references from the main text as a guide.

The following table summarizes the core focus of each worked example and links it to the primary sections discussed in the main guidance.

#	Sector	Key concept illustrated	What does it do?	Primary reference
C.1	CRE	Portfolio screening using PCRA	Shows systematic portfolio screening to efficiently identify assets requiring further attention based on risk thresholds.	1.2
C.2	CRE	Detailed asset PCRA and bank-led client engagement	Demonstrates comprehensive, end-to-end PCRA and subsequent engagement process for a single high-risk asset.	1.2, 3.2

C.3	Agri	Portfolio strategy and resilience-adjusted LTV	Provides a practical example of adjusting collateral valuation/LTV based on resilience assets for a portfolio segment.	3.1, 3.1.3 (Box 7)
C.4	RRE	Market analysis driving product development	Illustrates the flow from market and financial analysis to designing a specific A&R-linked product (Resilient Mortgage).	3.1.1, 3.1.3
C.5	Agri	Client-led engagement and validation	Demonstrates the bank's process for responding to and validating a client-initiated A&R financing request.	3.2
C.6	RRE	Systemic and stakeholder engagement	Illustrates bank action beyond lending, engaging wider stakeholders (govt, insurers) to address systemic risks.	3.2.1, 3.3.4

C.1. CRE | Portfolio screening using PCRA to identify high-risk assets

Purpose: This example demonstrates how a bank can conduct an initial Physical Climate Risk Assessment (PCRA) screening across a diverse Commercial Real Estate (CRE) portfolio to efficiently identify and prioritize assets requiring further due diligence or client engagement.

Scenario: A bank holds a UK-based CRE portfolio spanning multiple sub-sectors (Office, Retail, Industrial) and locations (including London, Manchester, Liverpool, York, Newcastle, Edinburgh, Birmingham, Malvern). The bank needs to understand the physical climate risk exposure across these assets.

Objective: 1) Systematically screen the CRE portfolio for inherent physical climate risks using readily available data and tools. 2) Identify material hazards and assign initial risk ratings based on exposure and basic sensitivity. 3) Determine which assets warrant further investigation based on bank policy, triggering subsequent detailed assessment and engagement.

Physical Climate Risk Assessment

Step 1: Gather Client Data Inputs

The bank's relevant teams (e.g., Commercial Banking, Sustainability, Data Management) collate key data for each asset in the portfolio:

Asset Identification: Client Name, Asset ID.

Geographic Location: Precise address or coordinates for each property.

Asset Characteristics: Sub-sector (Office, Retail, Industrial), basic information relevant to vulnerability (e.g., age, height—if available).

Financial Data: Loan exposure, property value (for context, not direct risk rating)

Outcome: structured dataset containing location and basic characteristics for all assets in the illustrative UK CRE portfolio.

Sub-sector	Client Name	Asset ID	Asset location
Office	Office A	Office A.1	10 Fenchurch Ave, London EC3M 5AG
	Office B	Office B.1	3 Piccadilly Pl, Manchester M1 3BN
	Office C	Office C.1	8 Princes Parade, Liverpool L3 1QH
		Office C.2	40 Bank St, London E14 5NR
Retail	Retail A	Retail A.1	5 Cumberland St, York YO1 9SW
	Retail B	Retail B.1	7 Akenside Hill, Newcastle upon Tyne NE1 3UF
	Retail C	Retail C.1	7 North Bridge, Arcade, Edinburgh EH1 1QL
Industrial	Health Care A	Industrial A.1	Selly Oak, Birmingham B29 6SQ
	Pharmaceutical B	Industrial B.1	New Frontiers Science Park, Third Avenue, CM19 5AW
	Automotive C	Industrial C.1	Pickersleigh Rd, Malvern WR14 2LL

Step 2: Identify Relevant Climate Hazards

Using geospatial climate data tools and platforms (referencing resources in Annex D, e.g., national meteorological services, commercial data providers), the bank screens each asset location against a range of relevant physical climate hazards for the UK context. Where data are unavailable, the bank uses proxies. Key hazards considered include:

- Flooding (Fluvial and Coastal)
- Extreme Heat
- Extreme Rainfall (leading to surface water flooding)
- Storms (High Winds)

The screening considers current and potentially future exposure under defined climate scenarios (e.g., IPCC SSP-RCP scenarios)

Outcome: hazard profile for each asset, indicating its exposure level (e.g., High, Medium, Low) to different climate hazards.

Asset ID	Material hazards identified			
	Flooding	Extreme rainfall	Temperature variation	Wind/storms
Office C.1	High	High	Low	High
Office A.1	High	Medium	Low	Medium
Office B.1	Medium	High	Medium	Low
Office C.2	High	Medium	Low	Medium
Office A.1	High	High	Low	Medium
Office C.1	Low	High	Medium	High
Office B.1	Medium	Medium	Low	Medium
Industrial A.1	Medium	High	Medium	Medium
Industrial B.1	Medium	Medium	Low	Medium
Industrial C.1	Low	Medium	Medium	Medium

Step 3: Determine Physical Climate Risk Materiality

The bank evaluates the potential impact (materiality) of the identified hazards on each asset. This combines the hazard exposure data with an internal scoring rubric and expert judgement that considers the asset type's sensitivity.

Step 4: Determine the Need for Physical Climate Risk Due Diligence

Based on the materiality of identified hazards and applying the bank's internal risk policy thresholds, an overall Inherent Physical Climate Risk Rating is assigned to each asset. This rating aggregates the individual hazard impacts. Assets exceeding a defined threshold (e.g., rated 'High' or 'Medium-High') are flagged as required in-depth due diligence..

Outcome:

Asset ID	Asset location	Inherent risk rating	Next Step based on Policy
Office C.1	Liverpool L3 1QH	High	Further Due Diligence
Retail A.1	York YO1 9SW	High	Further Due Diligence
Retail C.1	Edinburgh EH1 1QL	High	Further Due Diligence
Office C.2	London E14 5NR	Medium—High	Review/Potential DD
Industrial A.1	Birmingham B29 6SQ	Medium—High	Review/Potential DD
Office A.1	London EC3M 5AG	Medium—High	Review/Potential DD
Office B.1	Manchester M1 3BN	Medium—High	Review/Potential DD
Industrial C.1	Malvern WR14 2LL	Medium—Low	Standard Monitoring
Industrial B.1	Third Avenue, CM19 5AW	Medium—Low	Standard Monitoring
Retail B.1	Newcastle upon Tyne NE1 3UF	Medium—Low	Standard Monitoring

Note: the definitions of high, medium and low are dependent on financing context and individual bank assessment. The determination of rating is a bank decision, and banks may reference external resources in Annex D to support their assessment methodologies and rating approaches.

Triggering further action

The 'High' inherent risk rating assigned to assets like Retail A.1 (York), Office C.1 (Liverpool), and Retail C.1 (Edinburgh) triggers the bank's internal policy requirement for further, more detailed due diligence before new financing is approved or as part of ongoing portfolio management.

For asset Retail A.1 specifically, the bank would now initiate a structured client engagement approach to conduct in-depth due diligence. This deeper dive involves collaboratively assessing specific vulnerabilities and adaptive capacity, defining potential A&R solutions, agreeing on an Adaptation Action Plan, and determining the residual risk to inform credit decisions and monitoring. The detailed steps for this type of engagement are illustrated in Annex C.2 (Client Engagement Parts 1–4).

C.2. CRE | Detailed asset PCRA and bank-led client engagement

Purpose: This example demonstrates the bank's end-to-end process for assessing and managing physical climate risks for a specific CRE asset, aligning with the methodology in **Section 1.2** and incorporating client engagement (**Section 3.2**) and monitoring (**Section 3.5**).

Scenario: Dubai CRE asset refurbishment (logistics facility), USD 150m lending facility.

Objective: Identify risks, determine due diligence need, assess vulnerability, agree solutions, determine residual risk, monitor.

Physical climate risk assessment

Step 1: Gather client data inputs

Data gathering: RM collected financials, sector details, asset geographic data (Dubai CBD, Al Sufouh 2).

Step 2: Identify relevant climate hazards

Hazard materiality	Inherent risk rating
Flooding	H
Extreme heat	M
Water scarcity	L
Water quality	L
Total inherent risk rating	**Medium**

Hazard identification: Screened asset location using tools (e.g., Water Risk Filter tool and Climate Change Knowledge Portal)

Result: Identified Flooding (High 'H') and Extreme Heat (Medium 'M') as key risk drivers. Water scarcity noted as secondary.

Step 3: Determine Physical Climate Risk Materiality

Materiality assessment: Scenario analysis indicated potential impacts (increased flood frequency and damage; higher cooling costs). Combined hazard exposure, sensitivity, and initial adaptive capacity view led to:

- **Inherent risk rating**: Determined as **Medium**.

Step 4: Determine the Need for Physical Climate Risk Due Diligence

Outcome: Medium rating triggers the requirement for due diligence before financing proceeds (see Figure 6)

Client engagement

Step 1: Scene setting and opening dialogue

Client Engagement: RM initiated dialogue with ABC Corp, outlining PCRA findings (Flooding 'H', Heat 'M') and the due diligence requirement. Secured client cooperation for collaborative assessment.

Step 2: Needs assessment and awareness raising

- **Exposure evaluation:** Assessed interaction of refurbishment/operations with flooding/heat (direct impacts: structure, operations; indirect impacts: infrastructure, supply chains, tenants).
- **Sensitivity evaluation**: Assessed sensitivity of asset and reliant ecosystem to identified hazards.
- **Adaptive capacity assessment:** Assessed ABC Corp's adaptive capacity using TCFD pillars via targeted questionnaire. Result: noted strengths and weaknesses (e.g., adequate governance, inadequate risk management or metrics).
- **Vulnerability determination**: Combined hazard, sensitivity, and adaptive capacity led to dimension-specific ratings

Vulnerability	Dimension	Adjusted risk rating
Asset-based sensitivity	Flooding	M
	Extreme Heat	L
Client-based capacity	Strategy	L
	Metrics	L
	Risk Management	M
	Governance	L

Dimension	Guiding questions	Risk rating
Governance	Has the company allocated roles and responsibilities for the identification, assessment and management of physical climate risks?	Adequate
Strategy	Is the company's business model concentrated or diversified in terms of suppliers or customer base? Has the company developed an Adaptation Plan?	Inadequate
Risk management	Is the identification, assessment and management of physical climate risks integrated in the company's risk management system? Does the company have a track record in identifying, assessing and managing physical climate risks? Has the company contracted an insurance policy to cover the adverse consequences of climate-related events?	Inadequate
Metrics and targets	Does the company have metrics in place to measure its operational and financial performance in relation to physical climate risk and resilience and, where set, progress towards any climate-related targets?	Inadequate

Step 3: Defining support plan

Risk dimension		Adaptation solution	Implementation timeframe
Asset-based sensitivity	Addressing flooding risk	Installation of of an effective nature-based drainage facility	6 months from capital receipt
	Addressing extreme heat	Enhanced insulation	1 year from capital receipt
		Passive cooling	1 year from capital receipt
		Eater-efficient fixtures	1 year from capital receipt
		Solar sharing	1 year from capital receipt
Client-based adaptive capacity	Governance	Maintenance of existing governance structures and processes – quarterly Exco review	Immediate upon capital receipt
	Strategy	Refresh of risk management procedures to reflect physical climate risk management	Immediate upon capital receipt
	Risk Management	Climate resilient training for employees on procedures and processes around climate-related events/shocks	6 months from capital receipt
	Metrics and targets	Integration of physical climate risk metrics into performance monitoring and reporting e.g. management KPIs	6 months from capital receipt

A&R Solutions Identification: Collaborated with ABC Corp to identify specific A&R solutions (physical, operational, risk transfer) to mitigate key risks. **Result:** Agreed Adaptation Action Plan elements.

Residual Risk Assessment: Re-evaluated risk considering agreed A&R solutions.

Result: Residual Physical Climate Risk Rating assessed as Low ('L'). Financial implications assessed.

Reporting: Formal Due Diligence Report prepared and submitted to credit committee.

Step 4: Implementing support plan

Ongoing Engagement and Data Capture: RM uses periodic questionnaires/dialogue for updates on:

- Asset status and performance.
- Risk management effectiveness.
- Adaptation Action Plan progress.

Performance Assessment: Bank periodically reviews implementation status vs. agreed plan. Reassesses PCR context.

Opportunity Review: Compares implemented solutions to evolving best practice (no mandatory changes if risk remains Low).

Outcome: Residual PCR Rating formally updated (remained Low 'L' in this cycle). Outcome communicated to client. Monitoring continues,

C.3. Agri | Portfolio strategy and resilience-adjusted LTV

Purpose: Illustrates developing a Portfolio-Based Strategy (Section 3.1.3) by incorporating A&R factors into collateral valuation and LTV criteria for a specific segment (smallholder farmers).

Scenario: USD 50M concessional loan fund for East and West African smallholder co-operative agribusinesses (maize, sorghum, coffee), vulnerable to drought, lack traditional collateral.

Objective: Develop portfolio-level lending criteria recognizing specific adaptation assets to scale up lending and reduce financial risks.

Note: While this example focuses on a portfolio strategy, the principle of adjusting collateral valuation and lending terms based on verified resilience measures can also be adapted for individual counterparty assessments where sufficient data exists.

Step 1: Assess collateral value and LTV ratios (Assigns higher LTVs to adaptation assets like irrigation or agroforestry vs. standard land and equipment)

Determine the value of the adaptation assets	▪ Irrigation systems: USD 15 million ▪ Agroforestry investments: USD 10 million
Assign LTV ratios based on asset resilience	▪ Irrigation systems: 70% LTV (high resilience) ▪ Agroforestry investments: 60% LTV (medium resilience) ▪ Existing land and equipment: 50% LTV (low resilience)

Step 2: Calculate max loan amount (shows calculation combining standard and adaptation asset values with differentiated LTVs)

Maximum loan amount calculation	▪ (Adaptation asset value × LTV ratio) + (Existing asset value × LTV ratio)
Existing land and equipment value	▪ USD 30 million
Maximum loan amount	▪ (USD 15 million × 70%) + (USD 10 million × 60%) + (USD 30 million × 50%) ▪ USD 10.5 million + USD 6 million + USD 15 million = USD 31.5 million

Step 3: Structure lending criteria (shows resulting Loan Amount, overall LTV, and incorporates an interest rate adjustment—adaptation premium minus resilience discount)

Loan amount	▪ USD 25 million
LTV ratio	▪ 79% (USD 25 million/USD 31.5 million)
Interest rate	▪ Interest rate: Base rate (e.g., 9%) + Adaptation risk premium (e.g., 2%)—Resilience discount (e.g., -0.5%) = Effective Rate

Loan tenor	▪ 8 years
Repayment schedule	▪ Semi-annual principal and interest payments

C.4. RRE | Market analysis driving resilient product development

Purpose: This example illustrates the flow from identifying, qualifying, and quantifying a specific A&R finance opportunity (Section 3.1.1) to designing and structuring an A&R-linked financial product (Section 3.1.3) based on that analysis. It demonstrates how market assessment and financial viability analysis can justify the development of products that incentivize climate resilience in the Residential Real Estate (RRE) sector.

Scenario: A bank operates in a coastal community with 500 homes. Previous portfolio screening (PCRA) and market intelligence reveal significant flood risk, alongside strong homeowner demand for flood-resilient properties. Market analysis indicates resilient homes command a 5–10% price premium, sell ~30% faster, and ~75% of potential local homebuyers state willingness to pay more for flood protection. Local government also offers property tax incentives for resilient homes.

Objective: To assess the potential market size and financial viability for financing individual home resilience retrofits, and, if viable, to structure a commercially sound "Resilient Mortgage" product that incentivizes homeowners to invest in flood resilience, thereby reducing risk for both the homeowner and the bank.

Initial risk and market assessment	
Portfolio PCRA results	Initial analysis indicated ~40% of homes (200 homes) are within the 100-year floodplain, with high Average Expected Annual Damage (e.g., ~USD 15,000) for affected properties. Climate scenarios project increasing flood frequency/severity.
Market signals	High homeowner demand, documented price premiums for resilient properties, stated buyer willingness-to-pay, and local tax incentives collectively indicate a strong potential market for resilience solutions.
Key finding: Significant flood risk exists, coupled with strong market indicators → need for resilience solutions and a market willingness to value them.	
Adaptation Measures Considered	**Community-level:** Flood barriers, improved stormwater management, community resilience fund. ▪ **Estimated cost**: USD 5M upfront + USD 500K/year maintenance. ▪ **Estimated A&R benefit**: 50% flood risk reduction.
	Individual home retrofits: Flood-elevated foundations, flood-resistant materials. ▪ **Estimated cost**: USD 50K per home. ▪ **Estimated A&R benefit**: 80% flood damage reduction for retrofitted home.

Potential value creation	▪ Combined community and individual measures potentially increase home values by ~10%. ▪ Potential for ~20% insurance premium reduction for resilient homes (requires validation with insurers). ▪ Initial analysis suggests current average LTV is 60%. Post-retrofit, factoring in reduced risk and potential value increase, projected LTV could improve to ~55%.
Key finding: Specific adaptation measures have quantifiable costs and potential benefits (risk reduction, value creation, insurance savings), supporting the business case.	
Potential financing scenarios analyzed	▪ **Community-level loan:** A sustainability-linked loan (e.g., USD 10M, 15yr term, 2.9% + 25bps discount linked to KPIs) to the community association for shared infrastructure like flood barriers. Estimated IRR: ~8.5%. ▪ **Individual retrofit loans:** Loans to individual homeowners for property-level retrofits (e.g., USD 50K loan per home, 10yr term, 5.5%-7.5% interest rate). Estimated IRR: ~11%.
Key finding: Financial analysis suggests both community-level infrastructure financing and individual home retrofit loans could be commercially viable for the bank, supporting a multi-pronged approach.	
Resilient mortgage product development	
Core concept: Incorporate a 'resilience factor' into the lending criteria, adjusting the standard LTV assessment and potentially the pricing based on the home's verified resilience measures.	
Resilience factor	Standard LTV = Loan/Property Value (e.g., USD 400k Loan/USD 500k Value = 80% LTV). A 'Resilience Factor' is derived from the property's specific flood risk (PCRA score) and verified resilience measures (e.g., elevation, flood vents, materials). Higher resilience = higher factor (>1.0); Lower resilience/higher risk = lower factor (<1.0). **Resilience-Adjusted LTV = Loan/(Property Value × Resilience Factor)**
Standard home (non-resilient, high flood risk)	Apply a risk factor (e.g., 0.9) due to high flood risk. Resilience-adjusted value = USD 500k * 0.9 = USD 450k Resilience-adjusted LTV = USD 400k/USD 450k = **88.9%** **Higher adjusted LTV reflects higher lender risk**.
Resilient home (high flood risk, but post retrofit)	Apply a positive factor (e.g., 1.1) reflecting reduced risk. Resilience-adjusted value = USD 500k * 1.1 = USD 550k Resilience-adjusted LTV = USD 400k/USD 550k = **72.7%** **Lower adjusted LTV reflects lower lender risk.**
Profitability Impact: The lower effective risk (lower adjusted LTV) for resilient homes translates to a projected reduction in the default rate (e.g., from 1.5% to 1.0%). This improved credit performance is expected to increase the bank's return on capital for these loans (e.g., from 10% to 12%).	

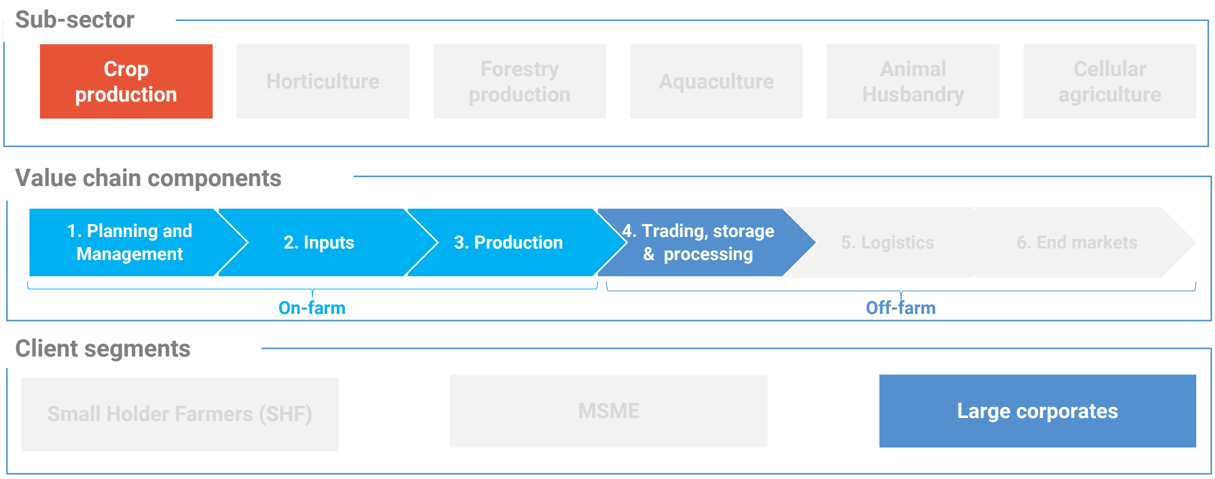
Resilient mortgage product offering

- Offer a **30bps interest rate discount** (e.g., 4.2% vs. standard 4.5%) for mortgages on homes in high-risk zones that meet pre-defined flood resilience standards (verified through documentation and inspection).
- Product is **conditional** on homeowners obtaining and maintaining adequate flood insurance coverage.

Key finding: The analysis indicates the Resilient Mortgage product, with its interest rate incentive, is expected to be more profitable for the bank than a standard mortgage in the same area due to significantly lower credit risk.

Overall outcome: Based on the comprehensive market assessment, financial viability analysis, and positive profitability outlook for the structured product, **the bank decides to launch the "Resilient Mortgage" product** to support homeowner adaptation in the target coastal community.

C.5. Agri | Client-led engagement and validation



Worked example client context for client-led engagement

Purpose: Illustrates how a bank responds to a client-initiated request for financing specific A&R measures, focusing on validation, structuring, and monitoring. Contrasts with bank-led engagement (C.1/C.2).

Scenario: Large established maize producer (existing client) approaches bank (ABC Bank) seeking finance for heat stress resilience measures (upgraded seed storage, increased crop storage, and Heating, Ventilation, and Air Conditioning (HVAC) systems).

Objective: Assess request, validate measures, structure finance, set up monitoring.

Client engagement
Steps 1 and 2: Opening dialogue and needs assessment
The RM gathers details from the client about the proposed investments: technical specifications, expected costs, anticipated benefits (e.g., reduced spoilage, maintained crop quality), alignment with the client's overall business plan, and the specific financing amount requested.
Outcome: **Clear understanding of the client's proposal ($X financing for specific storage and HVAC upgrades) and the underlying business driver (mitigating heat stress impacts).**

Validation and qualification

Technical Validation: Confirms measures are appropriate for mitigating heat stress in the region. Includes basic maladaptation check.

Taxonomy or Criteria Alignment: Checks alignment with internal criteria or external frameworks (e.g., CBRT). Found eligible.

Financial Analysis: Assesses client projections (costs vs. benefits—reduced loss, better quality), creditworthiness. Found financially sound.

Outcome: Validation confirms measures are technically sound, eligible, and financially viable.

PRIMARY Climate Resilience Theme	PRIMARY Sector	PRIMARY Sub-sector	SECONDARY Sector	Investment	Investment type	Suggested screening criteria [all TBC by TWG]	Climate Hazard Consequence
Resilient Agri-food Systems	Agricultural production	Crop production	Agri-food logistics, processing & retail	Conducting R&D for new cultivars	Adapting Measure	Total expected yield performance under [x]oC increase in temperatures against business as usual	Heat Stress
Resilient Agri-food Systems	Agricultural production	Crop production	Agri-food logistics, processing & retail	Creation of cool farm workforce shelters and housing	Adapting Measure	Temperature reduction potential of [x]oC/m2 against business as usual	Heat Stress
Resilient Agri-food Systems	Agricultural production	Crop production	Agri-food logistics, processing & retail	Field testing new crop cultivars	Adapting Measure	Total expected yield under [x]oC increase in temperatures against business as usual	Heat Stress
Resilient Agri-food Systems	Agricultural production	Crop production	Agri-food logistics, processing & retail	Implementation of controlled environment agriculture with cooling/ventilation	Adapting Measure	Temperature reduction potential of [x]oC/l against business as usual	Heat Stress
Resilient Agri-food Systems	Agricultural production	Crop production	Agri-food logistics, processing & retail	Installation of upgraded seed storage capacity	Adapting Measure	Amount of seeds stored in stable temperatures [x]kg against business as usual	Heat Stress
Resilient Agri-food Systems	Agricultural production	Crop production	Agri-food logistics, processing & retail	Installation of HVAC and cooling systems in storage spaces	Adapting Measure	Temperature reduction efficiency of [x]oC/m2 against business as usual	Heat Stress
Resilient Agri-food Systems	Agricultural production	Crop production	Agri-food logistics, processing & retail	Scaling up production for new cultivars	Adapting Measure	Total expected yield under [x]oC increase in temperatures against business as usual	Heat Stress
Resilient Agri-food Systems	Agricultural production	Crop production	Agri-food logistics, processing & retail	Upgrading harvested crop storage	Adapting Measure	Heat resistance of crop storage unit materials in [x]oC/t against business as usual	Heat Stress
Resilient Agri-food Systems	Agricultural production	Crop production	Agri-food logistics, processing & retail	Constructing / expanding / operating / upgrading agricultural production assets	Adapted Activity	Integration of investment-appropriate measures for hazard resilience	Heat Stress

CBRT-aligned client activities

Dimension	Guiding questions	Risk rating
Governance	Has the company allocated roles and responsibilities for the identification, assessment and management of physical climate risks?	**Adequate**
Strategy	Is the company's business model concentrated or diversified in terms of suppliers or customer base? Has the company developed an Adaptation Plan?	**Adequate**
Risk management	Is the identification, assessment and management of physical climate risks integrated in the company's risk management system? Does the company have a track record in identifying, assessing and managing physical climate risks? Has the company contracted an insurance policy to cover the adverse consequences of climate-related events?	**Inadequate**
Metrics and targets	Does the company have metrics in place to measure its operational and financial performance in relation to physical climate risk and resilience and, where set, progress towards any climate-related targets?	**Adequate**

Step 3: Defining support plan

Based on the positive validation, the bank structures a loan offer. This might involve:

- Potentially offering slightly preferential terms (e.g., a small interest rate discount or longer tenor) reflecting the risk reduction benefits of the A&R investment.
- Defining loan conditions, including reporting requirements related to the A&R measures.

Outcome: **A loan agreement is finalized, outlining the amount, terms, conditions, and monitoring requirements.**

Step 4: Implementing support plan

Financing: Funds are disbursed to the client.

Monitoring Setup: Agrees specific indicators or metrics with client (linked to A&R investments + standard financials). Example table showing dimensions, solutions, timeframe, indicators, metrics, targets.

Risk dimension	Adaptation and Resilience solution	Implementation timeframe	Monitoring indicator	Associated Metric	Target
Technical solution - Heat stress	Upgraded seed storage facilities	6 months from financing receipt	Volume of additional climate resilient seed storage	m^3	11m wide x 18m long x 9m high
	Increased harvested storage capability	6 months from financing receipt	Volume of additional climate resilient harvest storage	m^3	22m wide x 36m long x 9m high
	HVAC and cooling systems for harvested crops	1 year from financing receipt	Volume of climate resilient harvest storage under HVAC	m^3	22m wide x 36m long x 9m high
Adaptive capacity - Governance	Quarterly Exco review	Immediate upon financing receipt	Number of Exco reviews held	#	4 (annually)
Adaptive capacity - Strategy	Risk management procedure refresh	Immediate upon financing receipt	Percentage procedures reviewed	%	100
Adaptive capacity - Risk management	Climate resilient training	6 months from financing receipt	Percentage employees trained	%	75
Adaptive capacity - Metrics and targets	Physical climate risk metrics integration in management reporting	6 months from financing receipt	Number metrics reported	#	4

Outcome: **Client implements measures, bank monitors progress/impact via agreed KPIs.**

C.6. RRE | Systemic and stakeholder engagement

Purpose: Illustrates how a bank can engage beyond individual clients to address systemic risks and market barriers impacting a portfolio (RRE), focusing on awareness and advocacy. Links to Sections 3.2.1 (Systemic Factors) and 3.3.4 (Stakeholder Engagement).

Scenario: Bank with significant coastal mortgage portfolio observes increasing flood risk (via PCRA and market analysis), notes risk is unpriced, homeowners face barriers (optimism, cost, know-how), and insurance is becoming less available and affordable. Individual engagement is insufficient.

Objective: Raise awareness (homeowners, stakeholders) and advocate for systemic changes (policy, infrastructure, market practices) to enhance community resilience, mitigate portfolio risk, and potentially create future opportunities.

<table>
<tr><td>Challenge</td><td>Systemic nature: Individual property-level actions (e.g., raising a house) are less effective without wider community measures (e.g., sea walls, improved drainage) and supportive policy/market conditions.
Market failures: Unpriced risk leads to overvaluation (potential collateral risk); lack of affordable insurance increases client vulnerability and default risk.
Homeowner barriers: Homeowners may face various barriers to taking action, including:
▪ Optimism bias (“It won’t happen to me”).
▪ Prioritization (“Other issues seem more pressing”).
▪ Responsibility diffusion (“It’s the government’s job”).
▪ Cost concerns (“It’s too expensive”).
▪ Lack of know-how (“What can I realistically do?”).</td></tr>
<tr><td>Bank actions—Step 1</td><td>The bank adopts a multi-pronged strategy focused on awareness and advocacy:
1. Homeowner awareness campaign:
Develops clear, accessible content (e.g., website resources, brochures distributed via branches or local partners) explaining:
▪ Local flood risks and potential impacts (financial, safety).
▪ Benefits and examples of property-level resilience measures (preventative and adaptive).
▪ Available resources (e.g., government grants, technical guidance sources).
Potentially signals future bank interest or products supporting resilience (e.g., referencing concepts like the “Resilient Mortgage” illustrated in Annex C.4).
Rationale: Empower homeowners with knowledge to take individual action where feasible and build broader community demand for resilience solutions.</td></tr>
<tr><td>Bank actions—Step 2</td><td>2. Stakeholder Engagement and Advocacy
Local/national government: Engages policy teams to share anonymized portfolio risk insights and advocate for:
▪ Investment in resilient public infrastructure (drainage, flood defences).
▪ Updates to building codes and land-use planning to discourage development in high-risk areas.
▪ Financial incentives (e.g., grants, tax breaks) for homeowner resilience investments.
Insurance sector: Initiates dialogue (potentially through industry associations) to explore partnerships, understand future risk pricing signals, and potentially co-develop solutions (e.g., insurance linked to verified resilience measures).
Industry bodies/community groups: Partners with relevant organizations (e.g., housing associations, environmental NGOs) to amplify awareness messages and collaborate on community-level initiatives.
Rationale: Address systemic barriers and create a more enabling environment for resilience by influencing policy, infrastructure, market practices, and community action through collaboration.</td></tr>
</table>

Outcome (illustrative and ongoing)

- Increased awareness among homeowners regarding flood risks and available resilience options within target communities.
- The bank contributes practical, data-driven insights to inform local adaptation planning, policy discussions, and insurance market dialogues.
- Strengthened relationships with key stakeholders (government, insurers, community groups) create a foundation for future collaboration and potential partnerships (e.g., blended finance for community infrastructure, integrated financial products).
- The bank enhances its reputation as a proactive, responsible institution addressing local climate challenges.
- While direct, short-term financial returns from advocacy are unlikely, the strategy aims to achieve long-term portfolio risk reduction and contribute to a more stable and resilient local market.

Annex D: A&R frameworks and measurement resources

This Annex provides illustrative starting points for banks seeking tools, methodologies, and standards relevant to implementing climate adaptation and resilience (A&R). This list is non-exhaustive, and banks should consult the latest versions of these resources and refer to UNEP FI's Climate Risk Landscape reports for further updates on data providers and tools. Note that specific disclosure standards (e.g., IFRS S2, jurisdictional rules) are detailed in Table 6 (Section 3.3.5).

Resources	Link
Physical climate risk assessment resources	▪ ARIC Adaptation and Resilience Impact: A measurement framework for investors ▪ Umweltbundesamt (2022): How to perform a robust climate risk and vulnerability assessment for EU taxonomy reporting (including translation matrix for climate hazards across IPCC/EEA to EU Taxonomy classification) ▪ Equator principles (2023): Guidance Notes on Climate Risk Assessment ▪ EBRD (2018): advancing TCFD guidance on physical climate risks and opportunities ▪ ISO Standard 14091:2021: Adaptation to climate change — Guidelines on vulnerability, impacts and risk assessment ▪ UNEP FI: Climate Risk Landscape Report 2024 ▪ UNEP FI (2024): Managing physical climate-related risks in loan portfolios ▪ UNEP FI (2022): Physically Fit? How financial institutions can better disclose climate-related physical risks ▪ PRI: Assessing Physical Climate Risks in Private Markets ▪ UNFCCC NAP Central: Portal for accessing submitted National Adaptation Plans and related resources
Hazard-focused resources	▪ Water-related risks: WWF Water Risk Filter Tool ▪ Water-related risks: WRI Aqueduct ▪ Wildfire risks: ESA World Fire Atlas ▪ Sea-level risks: NASA Sea Level Portal ▪ Sea Level risks: NASA IPCC Sea Level Projection Tool ▪ Multi-hazard: NGFS Climate Impact Explorer (Climate Analytics) ▪ Multi-hazard: Open-Source Climate: Physical and Resilience tools

Sector guidance resources	▪ Infrastructure—Technical Guidance on Climate Proofing Infrastructures (European Commission, 2021) ▪ Infrastructure—IIGCC PCRAM (Physical Climate Risk Assessment Methodology) in Practice: Outputs and insights from climate resilience in action ▪ Energy—Hydropower Sector Climate Resilience Guide (Hydropower.org) ▪ Transport—Climate Risk and Ports: A practical guide on strengthening resilience (IDB Invest) ▪ Water—Resilient Water Infrastructure Design Brief (World Bank) ▪ Built environment—Universal Taxonomy for Natural Hazard and Climate Risk and Resilience Assessments (Arup, 2024) ▪ Real estate—Framework for Climate Adaptive Buildings (DGBC, 2024)
Climate A&R taxonomies/ qualification frameworks	Tailwind taxonomy for Adaptation and Resilience Investments Climate Bonds Initiative Resilience Taxonomy Guide for Adaptation and Resilience Finance | Standard Chartered (sc.com)

UNEP Finance Initiative (UNEP FI) brings together a large network of banks, insurers and investors that catalyses action across the financial system to deliver more sustainable global economies.

For more than 30 years the Initiative has been connecting the UN with financial institutions from around the world to shape the sustainable finance agenda establishing the world's foremost sustainability frameworks that help the finance industry address global environmental, social and governance challenges.

Convened by a Geneva, Switzerland-based secretariat, more than 500 banks and insurers with assets exceeding USD 100 trillion are individually implementing UNEP FI's Principles for Responsible Banking and Principles for Sustainable Insurance. Financial institutions work with UNEP FI on a voluntary basis to apply the sustainability frameworks within their industries using practical guidance and tools to position their businesses for the transition to a sustainable and inclusive economy.

Founded in 1992, UNEP FI was the first initiative to engage the finance sector on sustainability. Today, the Initiative cultivates leadership and advances sustainable market practice while supporting the implementation of global programmes at a regional level across Africa & the Middle East, Asia Pacific, Europe, Latin America & the Caribbean and North America.

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