CRISP

Climate Resilience Investments in Solutions Principles (CRISP)

An initiative led by:

GARI

Global Adaptation & Resilience Investment Working Group

The Lightsmith Group

In partnership with:

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I. Introduction and Objectives

Purpose

This document aims to provide investors with a framework and set of principles for investing in climate adaptation and resilience solutions ("adaptation" solutions hereafter).[1] **It also provides a non-exhaustive list of practical examples of such solutions per sector as well as details on key concepts and resources. The goal of this framework is to foster investment in adaptation solutions** by offering an approach to identifying companies across sectors and geographies that provide technologies, products and services that enable third parties to prevent, prepare for, respond to and recover from climate events (e.g. floods, droughts, cyclones, etc).

Background

- **This document builds on the process and learnings from the development of the 2020 Adaptations Solutions Taxonomy** produced by The Lightsmith Group through an extensive consultation process with leading climate experts. The 2020 taxonomy was created around an accelerator program aimed at identifying small and medium sized companies offering adaptation solutions in developing countries; by nature, the 2020 guide targeted early-stage investors and specific geographies.
- Despite the narrow focus, the 2020 taxonomy has gained substantial review and interest as a reference guide, screening tool and due diligence resource beyond its scope (see the Annex for more detail).
- Key lessons learned to date from usage and adoption of the 2020 taxonomy are reflected in this broader framework for identifying companies offering climate adaptation solutions in all geographies and growth stages.

(1) Adaptation is defined as the process of adjustments of human or natural systems to the actual or expected climate and its effects to prevent or mitigate harm or capitalize on any potential opportunities associated with climate change. Climate resilience is defined as ability of human or natural systems to withstand and recover from climate-related shocks or stressors (see Annex for details).

I. Introduction and Objectives

The objective of this framework is to provide investors a structured approach for identifying companies offering adaptation solutions based on the technologies, products and services offered. As a guide, this framework may enable investors to develop strategies and engage with investees to identify use cases and potential areas of business growth.

This framework is intended to be:
A dynamic and flexible tool with broad, high-level principles for investing in climate adaptation. Guidelines for how the framework and principles can be applied in different contexts are offered, with guardrails identified as needed.

Inclusive, with no prescriptive lists of technologies, products or services, and applicable to any sector, recognizing the climate change will affect all areas of the economy and all sectors must adapt.

Complementary to existing standards including guardrails investors should consider based on their specific circumstances.

This framework aims to:

- Encompass companies at all stages of growth: seed, venture, growth, listed equities.
- Encompass companies from all geographies, recognizing the relevance of transferring solutions across markets
- Fill a market gap yet build on existing standards and frameworks for adaptation (e.g. the EU Taxonomy).
- Serve a broad range of users, including:

Companies seeking growth opportunities

Market participants (investors, lenders, asset managers and owners)

Governments and other public good actors

II. Identification of Adaptation Solutions

Addressing systemic barriers to adaptation, including by removing information, technological, capacity and/or financial barriers to adaptation by others

AND /OR

Directly reducing material physical climate risks or their associated adverse impacts on other people, nature, physical assets or other economic activities

Enable to *prepare* and *prevent* physical climate risks by increasing the ability of people, nature, physical assets or businesses to understand climate-related risks and manage them with foresight

Enable to *respond* to physical climate risks by increasing the ability of people, nature, physical assets or businesses to cope and adjust to adverse conditions

Enable to *recover* from adverse physical climate impacts by increasing the ability of people, nature, physical assets or businesses to mitigate the adverse impacts of climate events and 'build-forward-better'

Examples of Resilience Solutions

Climate information services

Water-efficient irrigation system in drought prone rain fed context

Climate parametric insurance

Adaptation Continuum

Before **During** **After**

Note: (1) According to the EU Taxonomy, "systemic adaptation" activities aim to "actively reduce vulnerability and build resilience of a wider system, or systems, such as a community, ecosystem, or city".

III. Examples of Drivers for Adaptation Solutions

Climate-related risks and associated impacts are projected to increase with every degree of global warming if not managed. Climate risks and impacts drive the need for adaptation solutions. Opportunities for investment lie in the demand created for solutions driven by these impacts.

Climate Risks Drivers → **Impacts** → **Demand for Adaptation Solutions** → **Investment Opportunities**

Climate-Related Hazards	Socio-Economic and Ecosystem Impacts	Adaptation Solutions (*examples*)
Flooding 	• Property loss • Business and infrastructure interruption	• Flood early warning systems • Mangroves enhancement
Drought 	• Crop and livestock loss • Impairment of water quality	• Water storage technologies • Water preservation technologies • Water efficient irrigation technologies
Extreme Heat 	• Crop loss • Food spoilage • Heat stress on workers	• Sustainable cold chains for food systems • Cooling vests for workers
Wildfire 	• Health impacts • Property loss	• Air purification systems • Early monitoring and response devices
Hurricanes/Storms 	• Power outages • Property loss/damage • Infrastructure damage/failure	• Grid hardening technologies • Early warning systems • Building envelopes • Hurricane-resistant windows • Nature-based coastal buffers • Storm water management
Sea-Level Rise 	• Community-wide damages • Coastal erosion	• Digital networks • Remote imaging • Adaptive infrastructure • Artificial reefs

IV. Examples of A&R Enabling Solutions by Climate Hazard

Flood

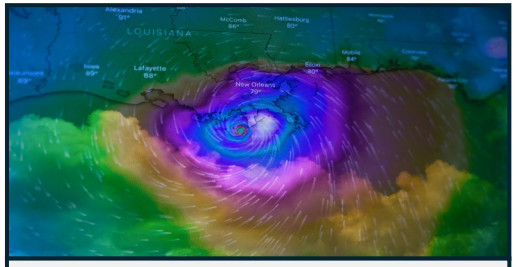
Climate services, LiDAR mobile mapping; water fates to protect houses; SMART airbrick; 3D printed temporary shelters; Mangroves and wetland restoration

Drought

Climate services for drought monitoring; groundwater recharging technologies; rainwater harvesting, wastewater reuse technologies; atmospheric water generator

Wildfires

Satellite imagery, drones and sensing technologies for early detection and monitoring; wildfire smoke air purification systems



Cyclone, Hurricanes, Storms

Early warning systems; hurricane-resistant windows; round houses; cyclone shelters; nature-based buffers (marshes, mangroves and coral reefs)

Sea Level Rise

Mangrove or wetlands restoration to prevent coastal flooding; resilient port infrastructure; Marsh foreshores; smart stormwater systems, storm sewers, bioswales

Extreme Heat

Sustainable cooling to manage heat stress; Cooling vests to ensure workers' safety in extreme temperatures

Hailstorm

Hail detection and mapping technologies; Anti-hail nets to protect crops; shade nets; climate insurance; resource efficient vertical farming

Landslides

Forestry and agroforestry to enhance slopes stability; biodegradable or geosynthetic mats; geosynthetics/ geoweb

Source: British International Investment.

III. Examples of Adaptation Solutions by Sector

Agriculture

Drought-tolerant crops, agroforestry, solar-powered water efficient irrigation or cold chain storage solutions to address the effects of climate shocks

Real Estate

Efficient cooling technologies, grey-water reuse technologies, rooftop rainwater harvesting; green roofs; 3D printed shelters

Water

Water storage and harvesting, water savings, loss reduction and recycling technologies, wastewater recovery and reuse technologies in drought-prone contexts

Technological Solutions

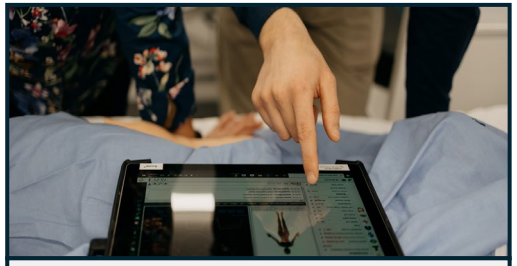
Climate risk analytics and geospatial solutions, early warning and response systems; digital climate advisory services to farmers

Infrastructure

Remote sensing systems; mangrove or wetlands restoration to prevent coastal flooding; smart stormwater systems, storm sewers, bioswales

Energy

Weatherization of renewable energy assets; grid resilience; battery storage; upgrade of hydropower plants



Health

Sustainable cooling to manage heat stress; early warning and response systems; Disease surveillance systems; diagnostic testing of vector-borne disease

Financial Services

Climate parametric insurance, data analytics to better assess borrowers' repayment risk and A&R benefits in the face of physical risks and associated impacts

Source: British International Investment.

II. Identification Of Adaptation Solutions Companies

- **An adaptation solutions company is a company that has as a significant business the provision of a technology, product, service and/or practice that enables others to prepare, prevent, respond to and recover from climate shocks and stresses.** The relative significance of a company's adaptation solutions business may vary depending on its stage of growth, business model and context of operation.
- **Based on its investment strategy and leverage, an investor can target the following two main typologies of companies to enable an adaptation solution company to grow and scale and/or support the growth of a company's adaptation business:**

Adaptation Solutions Companies
Companies offering adaptation solutions as a significant part of their business *(e.g. a climate data company)*

AND /OR

Companies Offering Adaptation Solutions
Companies offering adaptation solutions as part of their business, as one of their business lines (e.g. a general insurer offering climate insurance for agriculture)

- **Both types of companies are relevant to enhance the availability of and access to adaptation solutions**. Some companies might not be aware of their adaptation potential. Hence, investors can play a key role in unleashing it through capital, partnerships and engagement.
- Adaptation solutions are specific to various contexts in terms of geographies, sectors, communities and more. Demand for specific solutions will evolve over time, so investors are encouraged to develop a mindset for understanding climate impacts today and in the future, and identifying adaptation needs and opportunities.
- To build market trust and evidence, an investor should describe the type of companies targeted by its investment strategy and the proportion of capital invested in adaptation solutions in the reporting framework relevant to its context of operation (e.g., as required by the EU Sustainable Finance Disclosure Regulation - see Annex for details).

Key Considerations for Investors

The following steps aim to guide investors in the identification, assessment and selection of companies offering A&R solutions through the investment cycle. They also can help identifying 'entry points' for engagement activities.

Screening
Due Diligence
Monitoring

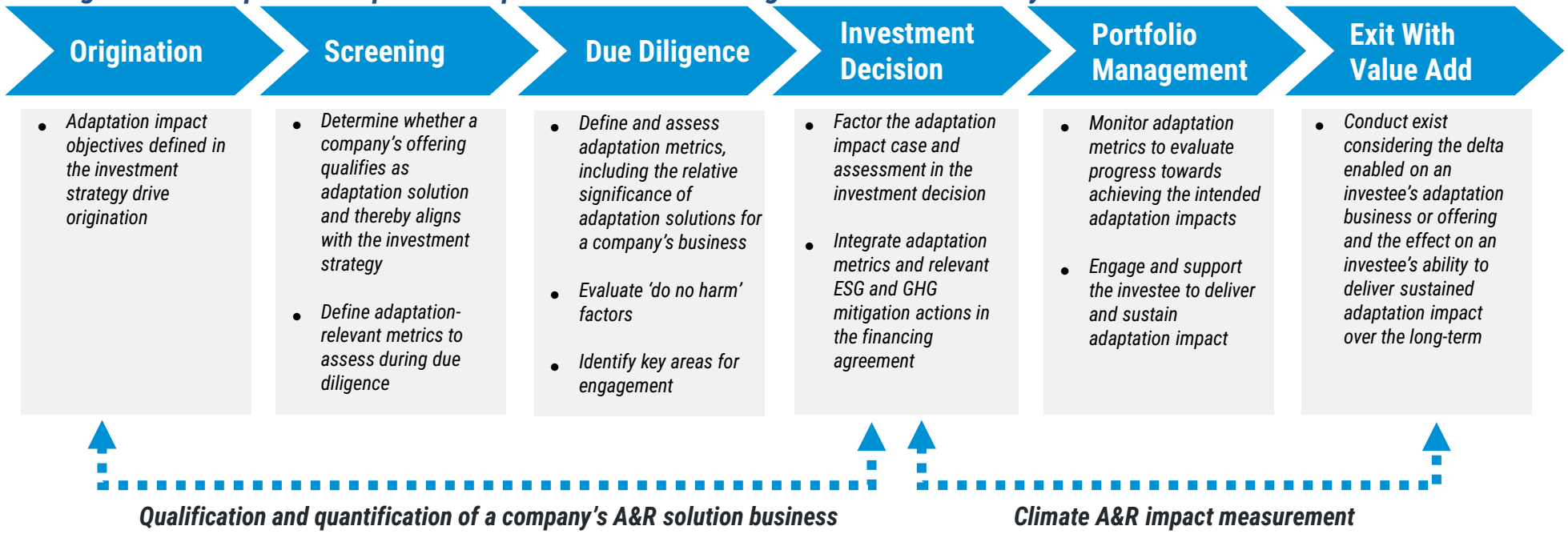
Steps	Guidance
Assess the company's offering for adaptation solutions	Determine whether a company's technology, product, service and/or practice enables to: • Prevent or reduce physical climate risks or their associated adverse impacts on people, nature, assets, or other economic activities and/or • Address systemic barriers to adaptation by removing information, technological, capacity and/or financial barriers to adaptation by others
Check 'do no harm' of the A&R solution and company	Evaluate both the A&R solution(s) offered by the company and the company itself **a)** Evaluate the adaptation solution offered for • Possible risks to the achievement of the 1.5°C goal of the Paris Agreement. Preference should be for A&R solution(s) minimally GHG-emissions intensive within a specific context and for those simultaneously delivering on adaptation and mitigation goals. (Through engagement, investors can support the decarbonisation of adaptation solutions). • Other potential risks of maladaptation e.g., inconsistency with local relevant regulations and strategies; causing adverse effects on social, environmental, economic, or physical aspects of the system served **b)**Taking a risk-based and proportionate approach, assess the company's commitment, capacity and track record for • Environmental, Social and Governance risk management • Physical climate risk management • Compliance with minimum social safeguards including OECD Guidelines for Multinational Enterprises and UN Guiding Principles on Business and Human Rights • Contributing to Paris alignment by excluding Paris mis-aligned activities from its customer base.
Measuring quantitatively and/or qualitatively impact results	• Assess the positive impacts already achieved by adaptation solutions (if available given the stage of a company's maturity) • Determine expected impacts over the life of the investment • Measure, monitor and manage positive adaptation impacts over the life of the investment.

IV. Impact Assessment and Management

Key Considerations for Investors

- **Measuring and demonstrating the positive results delivered by A&R solutions is integral to a company's business and the assessment of an investment's performance** (financial and/or impact performance). For a company, it is relevant for attracting both customers and investors; for an investor, it is instrumental to evaluate progress towards achieving the goals of its investment strategy.
- Investors can play a key role in engaging with and supporting their investees to deliver, measure, and communicate the positive impacts enabled by their A&R solutions offering.

Integration of the positive impact of adaptation solutions throughout the investment cycle[1]



Source: Authors' re-elaboration from the Operating Principles for Impact Measurement; See also Adaptation & Resilience Investors Collaborative (forthcoming)

IV. Impact Assessment and Management

Key Considerations for Investors

The Impact Management Project's Five Dimensions of Impact,[1] widely used within the impact investing community, provide investors with a structured approach for assessing the pathway to positive A&R impact. It allows to:

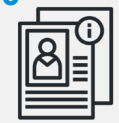
- Outline the A&R impact objective of an investment in a company offering A&R solutions ex-ante, at the time of the investment, and assess it ex-post, at the time of exit
- Determine how a company's A&R solution(s) contributes to delivering the positive A&R impact i.e., the causal chain between the solution and the context of physical climate risk targeted
- Determine who experiences the positive A&R impact and how much (breadth and depth[2])
- Identify possible risks to the delivery of the intended impacts to be managed through investment cycle
- Articulate an investor's role in achieving the A&R impact
- Define relevant metrics to assess and monitor A&R impact performances.

Leveraging the Five Dimensions of Impact, the Adaptation & Resilience Investors Collaborative is developing a consistent and comparable approach to enable investors to understand, assess and manage the positive A&R impacts of their investment. It will soon be published to fill a market gap.[3]

What

Impact a company's A&R solution offering is contributing to and how

Who



Which stakeholder experience they impact (stakeholder characteristics, geography)

How Much

How many stakeholders experienced the impact and degree of change (breadth and depth of change)

Contribution

Contribution of an investor to the achievement of the intended impact

Risk

Likelihood that impact will be different than expected

Note (1) Source: Impact Management Project (2019), Five Dimensions of Impact (2) Given the multi-dimensional nature of climate A&R, it is difficult to quantify the depth of impact, particularly ex-ante. Qualitative approaches e.g., ex-post surveys can be better suited particularly if the beneficiaries are people and communities (3) Adaptation & Resilience Investors Collaborative (2023), Development finance institutions and investors collaborate to advance adaptation and resilience and (forthcoming).

IV. Impact Assessment and Management

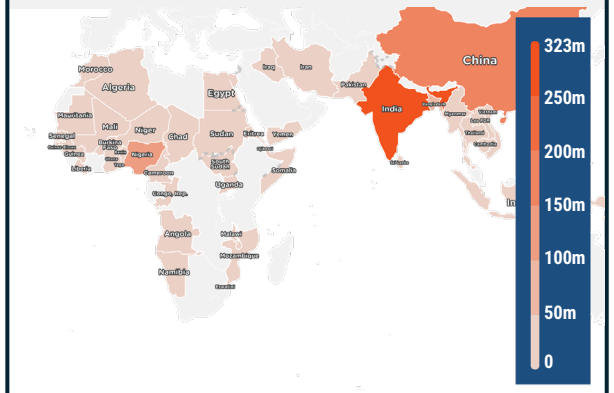
Key Considerations for Investors

A&R impact objectives against which investors could define investment strategies, portfolio/sub-portfolio level outcomes metrics and investment-specific indicators.[1]

Climate-resilient people	Climate-resilient economies (infrastructures and businesses)	Climate-resilient planet

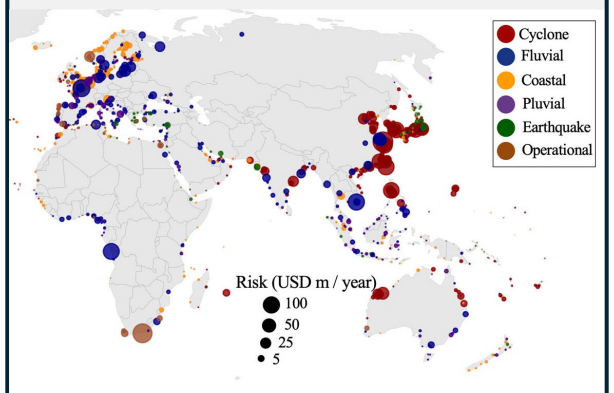
Illustration of needs for A&R solutions

Population at high risk due to a lack of access to cooling by country



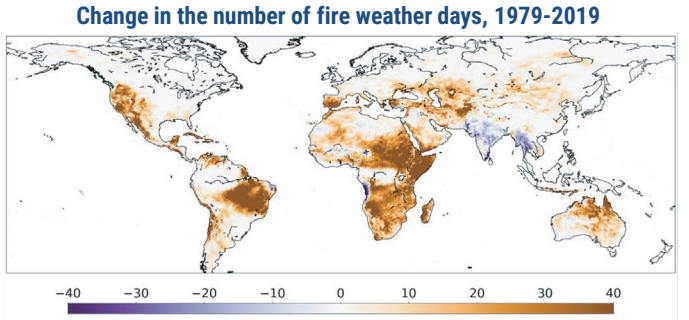
Sustainable Energy for All (2022), Global access to cooling gaps and 2030 forecast

Multi-hazard risk to global port infrastructure



Verschuu (2023), Multi-hazard risk to global port infrastructure and resulting trade and logistics losses

The frequency and severity of wildfires is increasing in many regions threatening ecosystems



Notes: Cumulative change in the duration of the fire weather season between 1979 and 2019 based on data from Vitolo et al. (2020) using the ERA5 dataset. Purple areas represent a decrease in the duration of the fire weather season, while brown areas represent an increase. Source: Adapted from Jones et al. (2022).

OECD (2023), Taming Wildfires in the Context of Climate Change
Adapted from Jones et al. (2022).

(1) Building on existing approaches, the Adaptation & Resilience Investors Collaborative identified these three main key impact areas;
Source: Adaptation & Resilience Investors Collaborative (2023), Development finance institutions and investors collaborate to advance adaptation and resilience and (forthcoming).

Key Considerations for Investors

- **The principles and criteria for identifying, assessing and selecting companies offering adaptation solutions may be applied differently based on an investor's role along the investment value chain and investment strategy.** This is because of varying degree of an investor's engagement and access to first-hand information.
- Impact measurement and management is integral to each stage of maturity and dependent on if and how relevant data and information are communicated by a company and through the investment chain.

Stage of a company's maturity

	Early Stage	Growth Stage	Scale-up	Maturity
	Venture Capital	**Private Equity**	**Listed Equity**	**Index Funds**
Access to business strategy and financial information	**High** Owner only access	**High** Owner only access	**Standard public reporting** • Additional information dependent on investor engagement	**Standard public reporting**
Impact measurement	**High** Customizable	**High** Customizable	**Standard public information**	**Standard public information only**

V. Paths Forward

GARI will encourage and facilitate further private sector investment in climate adaptation through this tool. Key steps include:

- Disseminate the CRISP Framework for review and consideration by investors through the GARI network of 500+ working group members and participants.
- Actively pursue uptake and harmonization through collaboration and engagement with climate finance organizations and networks.
- Encourage consideration of the framework for constructing a variety of investment strategies and vehicles.
- Engage with the Adaptation & Resilience Investors Collaborative (ARIC) to foster adoption of the impact assessment approach under development to enable consistency and comparability.[1]
- Incorporate feedback loops for further refinement grounded on practice and 'real-life' evidence.

GARI Convenings	• **Quarterly working group convenings** • **Virtual Speaker Series** • **COP Side Events**
Networks	• **Adaptation & Resilience Investors Collaborative** • **Institutional Investor Group for Climate Change (IIGCC)** • **Global Impact Investors Network (GIIN)** • **UNEP-FI and UN PRI**
Events '24	• **Battelle Innovation in Climate Resilience conference** • **London Climate Week** • **New York Climate Week** • **COP29**

Note (1): For more information, please see https://www.unepfi.org/climate-change/adaptation/adaptation-and-resilience-investors-collaborative/

VI. Authors and Acknowledgements

The authors of the Climate Resilience Investments in Solutions Principles (CRISP) are Chiara Trabacchi, Lori Collins, Tara Guelig, and Jay Koh.

The authors would like to acknowledge the following professionals for their cooperation and valued contributions to this document:

Note: The contents of this publication do not necessarily reflect the views of the authors organizations and of Expert Peer Reviewers or their organizations.

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Global Adaptation & Resilience Investment Working Group (GARI) *is a private sector, private investor-led initiative that was announced at Paris COP21 to bring together private and public sector investors, bankers, leaders, and other stakeholders. GARI's mission is to catalyze private sector investment in resilience.*

VII. Annexes

i. Methodology

The development of the A&R Solutions framework involved multiple steps and the engagement of numerous experts and practitioners from both the private and public sectors . **These steps were**:

1. **Elicited feedback on the 2020 Adaptation Solutions Taxonomy from a range of users, leadings experts and investors to make the framework practical for broad commercial application**
2. **Desk-based review of definitions, taxonomies, frameworks and approaches emerged since the publication of the 2020 Adaptation Solutions Taxonomy**
3. **Development of the proposed revised framework and principles for investing in climate adaptation and resilience solutions**
4. **Peer review, pilot-testing, and fine-tuning**

i. Methodology - application and new context of the 2020 Taxonomy

The 2020 Adaptation Solutions Taxonomy has received substantial review and interest as a reference guide.

Applications

- Screening criteria and guidance for identifying and assessing categories of investments
- Due diligence resource for individual entities

Current Context

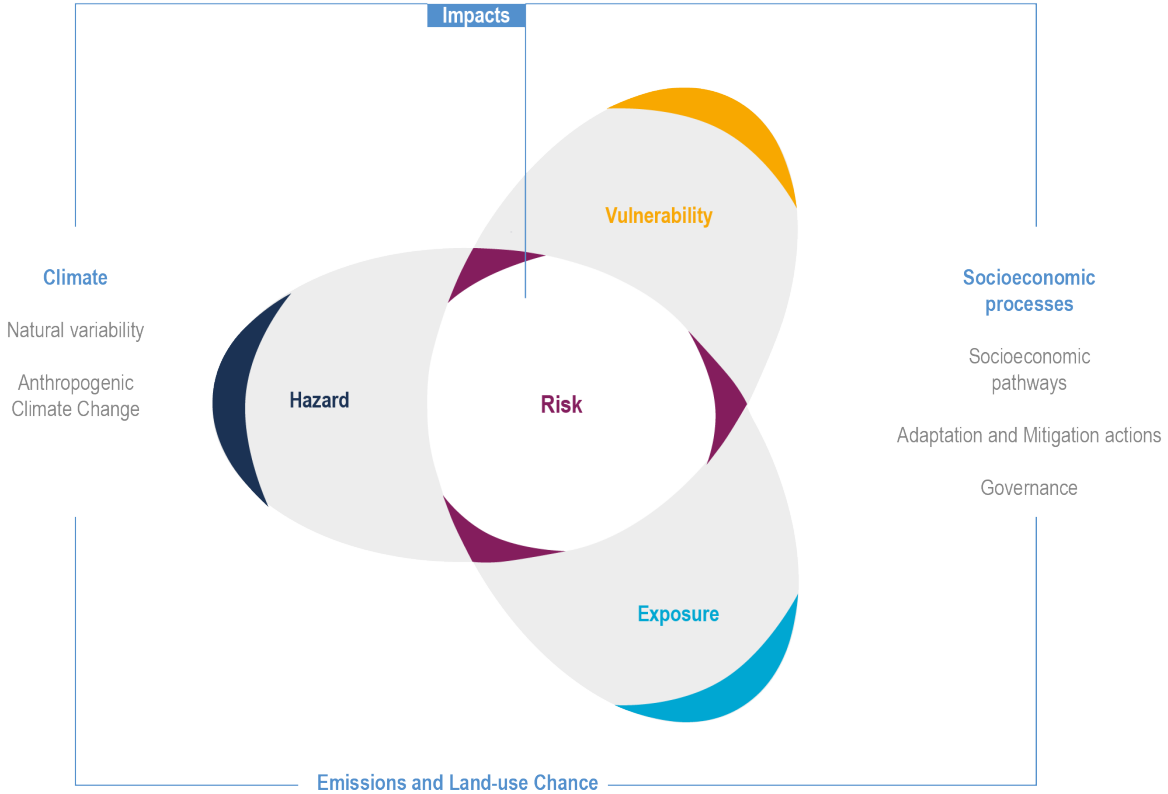
- EU Taxonomy for sustainable activities
- Climate Bonds Initiative's climate resilience framework for capital markets
- Desire to ensure consistency with existing frameworks

Figure 1: Overview of users or the Adaptation Solutions Taxonomy

Source: Lightsmith Group website; DFC Accelerating Climate Adaptation SMEs Adaptation and Resilience Challenge & Accelerator; Adaptation SME Accelerator Project (ASAP) – Africa and Asia; Private Adaptation Investment Bootcamp (PrivaBoo). Other initiatives that have referenced the 2020 Adaptation Solutions Taxonomy include GCA (2021), Financial Innovation for Climate Adaptation in Africa; CBI and UNDRR (2023), designing a Climate Resilience Classification Framework; UNEP-FI (2022), Adapting to a New Climate

ii. Key Resources Underlying the Adaptation Solutions Framework

Figure 2: The determinants of climate-related risks



In the context of climate change, risks can arise from the dynamic interactions among climate-related hazards, the exposure and vulnerability of affected human and ecological systems.

Risks can also arise from human responses to climate change not achieving their intended objectives or having trade-offs or adverse side effects.

Reducing, avoiding and sequestering GHG concentrations is critical to reduce climate-related hazards.

A&R solutions reduce exposure and vulnerability to climate-related hazards.

Source: IPCC, 2022: Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the AR6 of the IPCC. NB. The IPCC AR6 integrates response risks and complexity, including feedbacks, cascades, non-linear behavior. To facilitate understanding by a non-expert audience, the visual represented here is the one used in previous IPCC reports.

ii. Key Resources Underlying the Adaptation Solutions Framework

Figure 3: Classification of climate-related hazards[1]

	Temperature-related	Wind-related	Water-related	Solid mass-related
Chronic	Changing temperature (air, freshwater, marine water)	Changing wind patterns	Changing precipitation patterns and types (rain, hail, snow/ice)	Coastal erosion
	Heat stress		Precipitation or hydrological variability	Soil degradation
	Temperature variability		Ocean acidification	Soil erosion
	Permafrost thawing		Saline intrusion	Soilfluction
			Sea level rise	
			Water stress	
Acute	Heat wave	Cyclone, hurricane, typhoon	Drought	Avalanche
	Cold wave/frost	Storm (including blizzards, dust, and sandstorms)	Heavy precipitation (rain, hail, snow/ice)	Landslide
	Wildfire	Tornado	Flood (Coastal, fluvial, pluvial, ground water)	Subsidence
			Glacial lake outburst	

Note (1) The list of climate-related hazards in this table is non-exhaustive, and constitutes only an indicative list of most widespread hazards that are to be taken into account as a minimum in the climate risk and vulnerability assessment; Source: EU Taxonomy Delegated Act Climate Annex II 2021/2139

Note: Different organizations use different definitions and taxonomies of climate-related hazards, which may present some barriers to wider action on physical climate risk management; The Table above provides the breakdown of physical climate-related hazards provided by the EU Taxonomy, which was developed in an attempt to arrive to a more consistent one. The EU Taxonomy's classification combines climate-related hazards with the risks on physical and biological systems. (For reference, according to the IPCC, climate-related hazards include changing temperature (air, freshwater, marine water); temperature variability, changing wind patterns; cyclone, hurricane, typhoon, storm, tornado, changing precipitation patterns and types (rain, hail, snow/ice); precipitation variability; heavy precipitation). Secondary hazards resulting from climate-related hazards are also relevant. As an example, new biological pests or increased prevalence of existing pests can result from changing temperatures

ii. Key Resources Underlying the Adaptation Solutions Framework

Definition and criteria for identifying activities enabling adaptation	References
The activity reduces material physical climate risk in other economic activities and/or addresses systemic barriers to adaptation and is itself also adapted to physical climate risks. **Activities enabling adaptation include**, but are not limited to, activities that: **a) Promote a technology, product, practice, governance process or innovative uses of existing technologies, products or practices (including those related to natural infrastructure); or,** **b) Remove information, financial, technological and capacity barriers to adaptation by others.** **The economic activity reduces or facilitates adaptation to physical climate risks beyond the boundaries of the activity itself**. The activity will need to demonstrate how it supports adaptation of others through: (i) an assessment of the risks resulting from both current weather variability and future climate change, including uncertainty, that the economic activity will contribute to address based on robust climate data; (ii) an assessment of the effectiveness of the contribution of the economic activity to reducing those risks, taking into account the scale of exposure and the vulnerability to them. In the case of infrastructure linked to an activity enabling adaptation, that infrastructure must also meet the screening criteria of adapted activities.	EU Technical Expert Group on Sustainable Finance (2020), Taxonomy Report: Technical Annex (2020)
An economic activity shall be considered to contribute substantially to climate change adaptation where that economic activity provides adaptation solutions that contribute substantially to **preventing or reducing the (risk of) adverse impact of the current and expected future climate on other people, nature or assets**, without increasing the risk of an adverse impact on other people, nature or assets. Identifies a set of activities which to be considered as an enabling activity, the economic operator demonstrates, through an assessment of current and future climate risks, including uncertainty and based on robust data, that the activity provides **a technology, product, service, information, or practice, or promotes their uses** with one of the following primary objectives: • **increasing the level of resilience to physical climate risks of other people, of nature, of cultural heritage, of assets and of other economic activities;** • **contributing to adaptation efforts of other people, of nature, of cultural heritage, of assets and of other economic activities.** These activities are: ○ Forestry (afforestation; rehabilitation and restoration of forests; forest management; conservation forestry; Restoration of wetlands) ○ Creative, arts and entertainment activities ○ Consultancy for physical climate risk management and adaptation; ○ Desalination ○ Education ○ Engineering activities and related technical consultancy dedicated to adaptation to climate change ○ Emergency Services (e.g. post-disaster relief activities, setting up, maintenance and operation of emergency communication systems to ensure communications during and after emergencies etc.) ○ Flood risk prevention and protection infrastructure [structural and non-structural such as dykes, river embankments; flood early warning systems ○ Libraries, archives, museums and cultural activities ○ Motion picture, video and television programme production, sound recording and music publishing activities ○ Non-life insurance: underwriting of climate-related perils ○ Programming and broadcasting activities ○ Reinsurance of climate-related perils ○ Software enabling physical climate risk management and adaptation ○ To determine substantial contribution, it set specific, tailor-made criteria for a limited number of enabling activities. These are mostly qualitative in nature.	**EU Taxonomy Regulation** 2020/8252 – Article 11 Delegated Act Climate Annex II 2021/2139 and its Amendment June, 2023 Working Document - Impact Assessment Report (2021)

ii. Key Resources Underlying the Adaptation Solutions Framework

Definition and criteria for identifying *activities enabling adaptation*	References
In overall consistency with the definition of the IPCC, defines economic activities enabling adaptation as an economic **activity that provides adaptation solutions that contribute substantially to preventing or reducing the risk of adverse impact or substantially reduces the adverse impact of the current and expected future climate on other people, nature or assets**, without increasing the risk of an adverse impact on other people, nature and assets. To qualify, an economic activity needs to meet the following screening criteria: **The economic activity reduces material physical climate risk in other economic activities and/or addresses systemic barriers to adaptation.** Activities enabling adaptation include, but are not limited to, activities that: **a) Promote a technology, product, practice, governance process or innovative uses of existing technologies, products or practices (including those related to natural infrastructure); or,** **b) Remove information, financial, technological and capacity barriers to adaptation by others** **The economic activity reduces or facilitates adaptation to physical climate risks beyond the boundaries of the activity itself.** The activity will need to demonstrate how it supports adaptation of others through: • **An assessment of the risks** resulting from both current weather variability and future climate change, including uncertainty, that the economic activity will contribute to address based on robust climate data; • **An assessment of the effectiveness of the contribution** of the economic activity to reducing those risks, taking into account the scale of exposure and the vulnerability to them In the case of infrastructure linked to an activity enabling adaptation, that infrastructure must also meet the screening criteria of adapted activities i.e. The economic activity must reduce all material physical climate risks to that activity to the extent possible and on a best effort basis; The economic activity and its adaptation measures do not adversely affect the adaptation efforts of other people, nature and assets; The reduction of physical climate risks can be measured.	South African Green Finance Taxonomy (2022)
Activities that directly reduce physical climate risk and build the adaptive capacity of the system within which the activity takes place and activities that contribute to reducing the underlying causes of vulnerability to climate change at the systemic level and/or removing knowledge, capacity, technological and other barriers to adaptation. **This type of activity supports adaptation beyond its immediate scope** by creating enabling conditions for policy and regulatory environment developments, physical or natural asset enhancements, capacity strengthening, technology developments or knowledge enhancements. These activities are themselves adjusted to cope with the experienced and anticipated impacts of climate change. *Examples*: Research and development of crop breeds more resilient to drought; Levee system to protect a region including towns, businesses, infrastructure and agricultural land from the increased risk of flooding; Introduction of crop breeds to increase small farmers' resilience to drought in a region with a high risk of precipitation, as part of an integrated agriculture project. Diversification of water sources needed in a city's water supply system to meet the increased demand of a growing population and to reduce risks to the water supply system resulting from droughts. [The Joint MDBs approach introduces so-called "Type 2 - Activities that have shared objectives of adaptation and development". The definition outlined above integrates this Type 2 activities within enabling activities (Type 3) as, for instance, the EBRD's approach (GET 2023)].	MDBs (2022), Joint Methodology for tracking Climate Adaptation Finance (2022)

ii. Key Resources Underlying the Adaptation Solutions Framework

Identifying Adaptation Solutions | Assessing Adaptation Solutions | Quantifying Investments in Adaptation

Definition and criteria for identifying *activities enabling adaptation*	References
Under the CBI's Climate Resilience Principles, an 'enabling' activity is what the document defines as system-focused activities i.e. activities that have the intention is to deliver climate resilience benefits to the broader system (i.e., going beyond merely ensuring an asset's or activity's performance over its design lifespan). To be effective, such an asset or activity will also need to have a sufficient degree of resilience to climate change.	**CBI (2019),** Climate Resilience Principles A framework for assessing climate resilience investments
Enabling investments are investments that enable the climate resilience of other assets, activities or entities. *Examples include:*	**CBI (2023),** Designing A Climate Resilience Classification Framework - To Facilitate Investment In Climate Resilience Through Capital Markets

Measures	Asset	Activity	Entity
• Launching a new product line of weather forecasting equipment for small farmers • Integrating desalination equipment facilities into municipal water supplies to ensure service continuity during droughts	• Setting up an additional weather monitoring station by a state meteorological agency that provides weather and climate information to farmers in a part of the country not previously covered • Constructing coastal defenses to protect communities, businesses and infrastructure from increasing flood risk	• Producing heat-tolerant road surfacing materials that enable road transport to become more resilient to extreme heat events • Launching new immunization services to protect populations from infectious diseases with wider vector coverage due to shifting temperature patterns	• Company that manufactures smart agriculture equipment that minimizes water demand in crop production • State agency running a catastrophe risk pool mechanism that provides payouts to households affected by extreme weather events

ii. Key Resources Underlying the Adaptation Solutions Framework

Definition and criteria for qualifying an activity as an *activity enabling adaptation*	References
Requires enabling activities to: 1. **Demonstrate contribution to adaptation** 2. **Do No Significant harm ('DNSH')** i.e., an enabling activity must • Meet the criteria for Do No Significant Harm to other environmental objectives, whilst avoiding adverse impacts to people, asset and nature and preventing a lock-in in activities that undermine long-term environmental goals i.e. ○ An activity contributing to climate change adaptation must avoid significant harm to climate change mitigation and the other four environmental objectives: ○ Sustainable use and protection of water and marine resources ○ Transition to a circular economy, waste prevention and recycling ○ Pollution prevention and control ○ Protection of healthy ecosystems and • Comply with minimum social safeguards established for the Taxonomy 1. **Measure adaptation-related outcomes.**	EU Technical Expert Group on Sustainable Finance (2020), Taxonomy Report: Technical Annex (2020)
• **Do no significant harm ('DNSH')** The DNSH criteria outlined in the regulation are specific to the set of identified enabling activities (see slide 23) and EU regulations / directives. For desalination, for instance, it defines ○ A GHG emission threshold for DNSH to mitigation ("the greenhouse gas emissions from the desalination plant do not exceed 1080 gCO2e/m3 of freshwater produced (including treatments, pumping and brine disposal and the related energy use). ○ Requirements for brine disposal and related to feedwater • **Compliance with minimum social safeguards** is a condition for economic activities to qualify as environmentally sustainable. Hence, activities should only qualify as environmentally sustainable where they are carried out in alignment with the **OECD Guidelines for Multinational Enterprises** and **UN Guiding Principles on Business and Human Rights, including the principles and rights set out in the eight fundamental conventions identified in the Declaration of the International Labour Organisation on Fundamental Principles and Rights at Work and the International Bill of Human Rights.** When complying with those minimum safeguards, undertakings should therefore adhere to the principle of 'do no significant harm' referred to in Regulation (EU) 2019/2088, and consider the regulatory technical standards adopted pursuant to that Regulation that further specify that principle.	**EU Taxonomy Regulation** 2020/8252 – Article 11 Delegated Act Climate Annex II 2021/2139 and its June 2023 Amendment Working Document - Impact Assessment Report (2021)

ii. Key Resources Underlying the Adaptation Solutions Framework

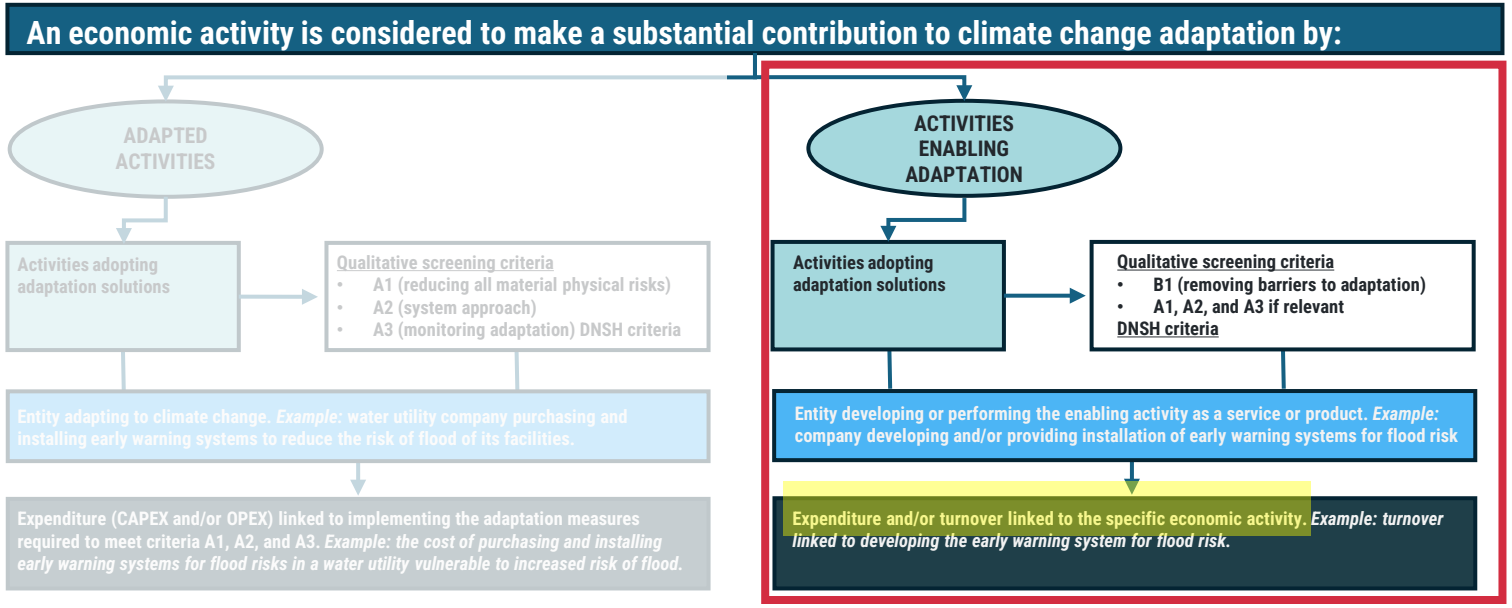
Identifying Adaptation Solutions | **Assessing Adaptation Solutions** | Quantifying Investments in Adaptation

Definition and criteria for qualifying an activity as an *activity enabling adaptation*	References
The DNSH and the minimum safeguards are also integrated into the EU Sustainable Finance Disclosure Regulation (SFDR). For products classified as Article 8 ('light green') and 9 ('dark green), for instance, requires to explain the following aspects of the investment decision-making process • How do the sustainable investments not cause significant harm to any environmental or social sustainable investment objective and • How are the sustainable investments aligned with the OECD Guidelines for Multinational Enterprises and the UN Guiding Principles on Business and Human Rights?	EU Sustainable Finance Disclosure Regulation (SFDR) [Regulations emerging in other jurisdictions share similar underlying principles]
MDBs have developed a joint methodology to assess the alignment of their operation to the Paris Agreement. This assessment is linked to the adaptation finance tracking approach and provides an **effective filter to ensure that MDB financing causes no significant harm** to the abilities of communities, economic activities and the environment to cope with physical climate risks. **The MDBs' Paris Alignment developed a list of List of Activities Considered Universally Aligned with the Paris Agreement's Mitigation Goals or Not Aligned.** The Paris Alignment 'filter' complements the IFC Performance Standards that MDBs and other public and private investors apply. EDFI members also committed to Paris Alignment. At the project level, EDFI has adopted an approach for direct investments that separates investments into the categories of "aligned", "misaligned", and "conditional financing", with "aligned" investments defined as those that qualify as climate finance based on the MDB / IDFC Common Principles For Climate Mitigation Finance Tracking (2015) and **"misaligned" investments to be defined, at a minimum, as those on the EDFI Fossil Fuel Exclusions List.** **Benchmarks for the EDFI members are the UN Declaration of Human Rights, the ILO Core Conventions and the IFC Performance Standards on Economic and Social Sustainability and associated Environmental and Health & Safety Guidelines.**	MDBs (2022), Joint Methodology for tracking Climate Adaptation Finance (2022) Joint MDB Methodological Principles for Assessment of Paris Agreement Alignment EDFI (2022), EDFI adopts harmonised Paris Alignment approach. **See also** Shared Policies

ii. Key Resources Underlying the Adaptation Solutions Framework

Identifying Adaptation Solutions | Assessing Adaptation Solutions | **Quantifying Investments in Adaptation**

Definition and criteria for quantifying adaptation finance	References
The Taxonomy introduces disclosure requirements differentiated between financial and non-financial companies. For non-financial companies, the disclosure must **include the proportion of turnover or expenditures (CAPEX and/or OPEX) linked to the qualifying activity enabling adaptation. Only enabling activities can count their turnover as Taxonomy-aligned from an adaptation perspective.** **Financial companies are required to state:** **i. how and to what extent they have used the Taxonomy in determining the sustainability of the underlying investments;** **ii. to what environmental objective(s) the investments contribute; and the proportion of underlying investments that are Taxonomy-aligned**, expressed as a percentage of the investment, fund or portfolio.1	EU Technical Expert Group on Sustainable Finance (2020), Final report of the Technical Expert Group on Sustainable Finance; Taxonomy Report: Technical Annex (2020)



Financial Metric	Climate Change Adaptation
Turnover*	Turnover can be recognized only for activities enabling adaptation
CAPEX & OPEX*	Can be counted where costs incurred (capex and, if relevant, opex) are part of a plan to meet Taxonomy technical screening criteria for substantial contribution to climate change adaptation and relevant DNSH criteria.

Notes: (1) For more details, please see EU Technical Expert Group on Sustainable Finance (2020), Taxonomy: Final report of the Technical Expert Group on Sustainable Finance. .
(*) Turnover – Definition Net turnover means the amounts derived from the sale of products and the provision of services after deducting sales rebates and value added tax and other taxes directly linked to turnover. Overall turnover is equivalent to a firm's total revenues over some period of time. Capex & Opex: A capital expenditure (capex) is a payment for goods or services; Operating expenses (opex) are shorter term expenses required to meet the ongoing operational costs of running a business.

ii. Key Resources Underlying the Adaptation Solutions Framework

Definition and criteria for quantifying adaptation finance

Figure 3: How to apply the Taxonomy to an equity portfolio

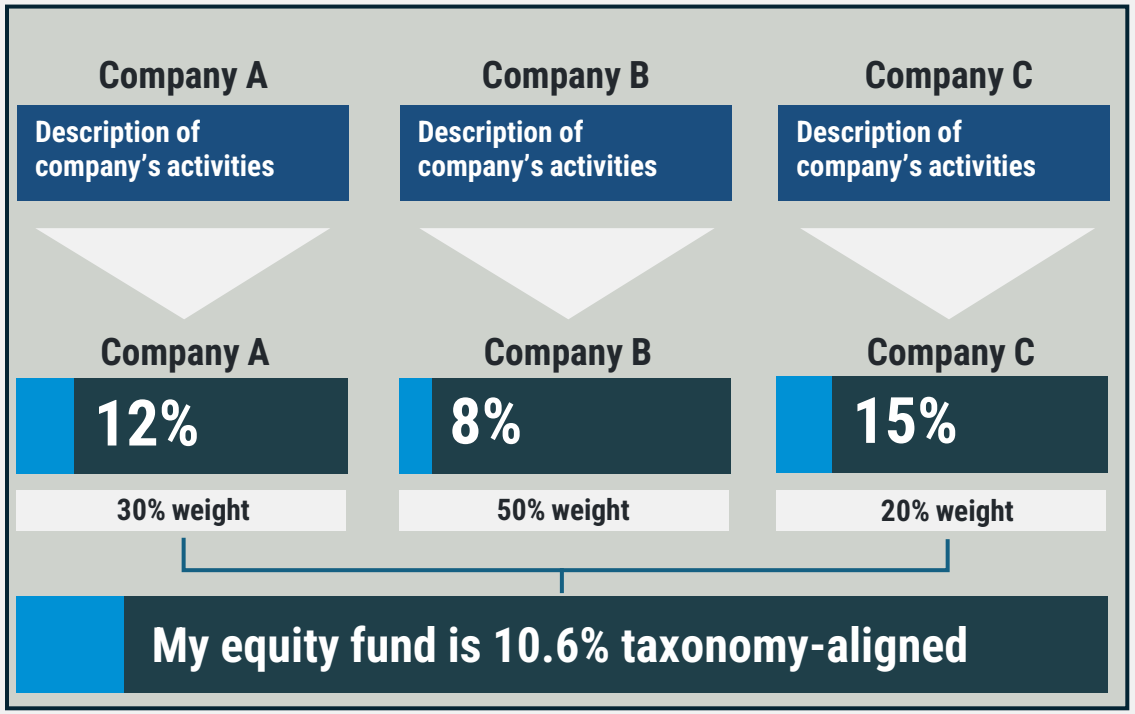


Figure 3 illustrates how to apply the Taxonomy to a portfolio of company investments, considering turnover as the proxy for equity exposure to Taxonomy-aligned activities.

For economic activities which have substantial contribution criteria defined, **the TEG recommends that investors present their disclosure as follows:**

1. **The percentage of the fund that can be demonstrated to align with the Taxonomy** (either where full disclosure has been made by the company, or where the investor has independently evaluated the Taxonomy eligibility of the company, including with the use of estimated or modelled data).
2. **The percentage of the fund that is potentially aligned. The investor has good reason to believe that the underlying activity is aligned, but full compliance has not been demonstrated**. The investor should explain which technical screening criteria could not be verified and why, the nature of the due diligence they have conducted, engagement with the company (if undertaken) and results, and how estimates, where appropriate, have been calculated.

References

EU Technical Expert Group on Sustainable Finance (2020),

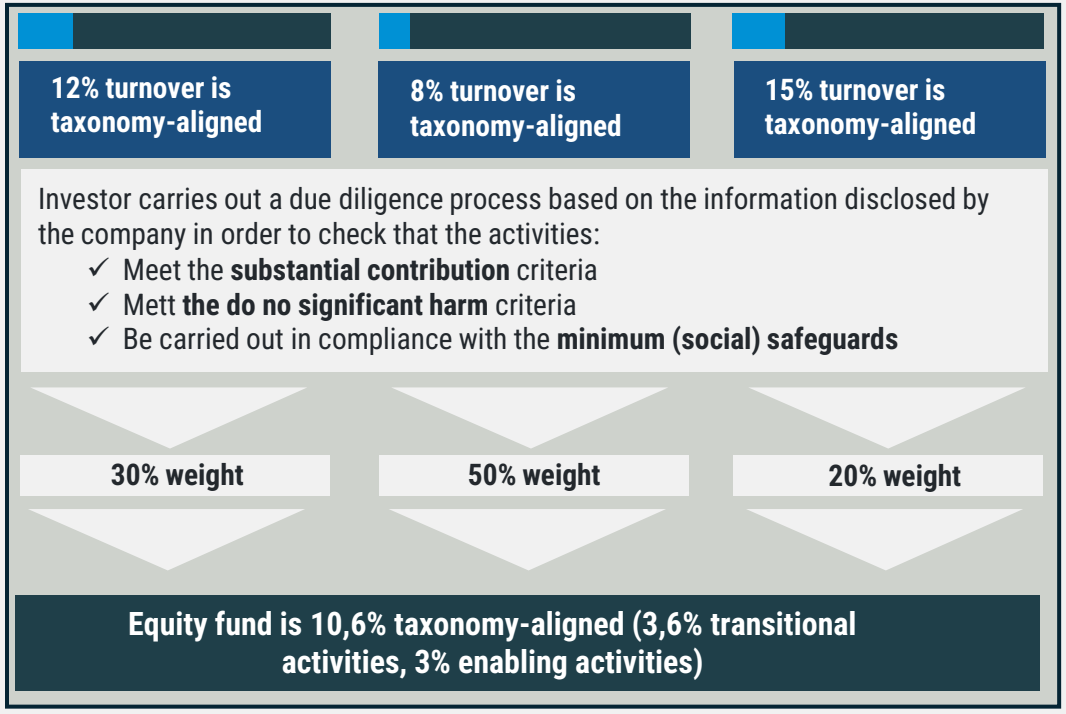
Final report of the Technical Expert Group on Sustainable Finance;

Taxonomy Report: Technical Annex (2020)

ii. Key Resources Underlying the Adaptation Solutions Framework

Definition and criteria for quantifying adaptation finance

Figure 4: EU Taxonomy alignment applied to an investment portfolio



The Taxonomy Regulation requires certain companies[1] to report **information on the proportion of the turnover, capital expenditure (CapEx) or operating expenditure (OpEx) associated Taxonomy-aligned activities**. Smaller companies, including SMEs ('non-NFRD undertakings') may decide to voluntarily disclose their taxonomy-alignment for the purpose of accessing sustainable finance.

The Commission Delegated Regulation 2021/2139 supplementing Regulation (EU) 2020/852 indicates that **when the core business of economic activities enabling adaptation** in accordance with Article 11(1), point (b), of Regulation (EU) 2020/852 **is to provide technologies, products, services, information, or practices with the objectives of increasing the level of resilience to physical climate risks of other people, nature, cultural heritage, assets or of other economic activities, in addition to capital expenditure, the turnover derived from products or services associated with those economic activities should be considered** as proportion of turnover derived from products or services associated with economic activities that qualify as environmentally sustainable.

It requires financial institutions[2] to disclose the degree of alignment of their financial products with the EU Taxonomy. Asset managers, for instance, should report the proportion of taxonomy-aligned investments managed in the value of all covered assets under management from both its collective and individual portfolio management activities (Green Investment Ratio). The weighted average of taxonomy-aligned investments should be based on the share of taxonomy-aligned economic activities of investee companies. Asset managers shall rely on the underlying investee companies' KPIs to compute their own Green Investment Ratio.

The Taxonomy Regulation does not define any mandatory list, exclusion list or minimum threshold for investments into companies with a high Taxonomy alignment

References

EU Taxonomy Regulation 2020/8252

Delegated Act Climate Annex II 2021/2139 **and its** Amendment June, 2023

Commission Staff Working Document - Impact Assessment Report (2021)

FAQ: What is the EU Taxonomy Article 8 delegated act and how will it work in practice?

Notes: (1) Companies under the scope of the Non-financial Reporting Directive (NFRD) will have to disclose the Taxonomy-aligned percentage of their turnover and expenditures; (2) Please see the Disclosure Regulation (Article 2) for a definition of financial market participant (e.g.. an insurance undertaking which makes available an insurance- based investment product (IBIP); (b) an investment firm which provides portfolio management; etc.). The aim of disclosure obligations is to ensure that information related to the EU Taxonomy is accessible, coherent and consistent along the investment chain among companies subject to the NFRD, financial market participants under the SFDR.

ii. Key Resources Underlying the Adaptation Solutions Framework

Definition and criteria for quantifying adaptation finance

Figure 5: SFDR required disclosures

Does this financial product have an investment objective?
(tick and fill in as relevant, the percentage figure represents the minimum commitment to sustainable investments)

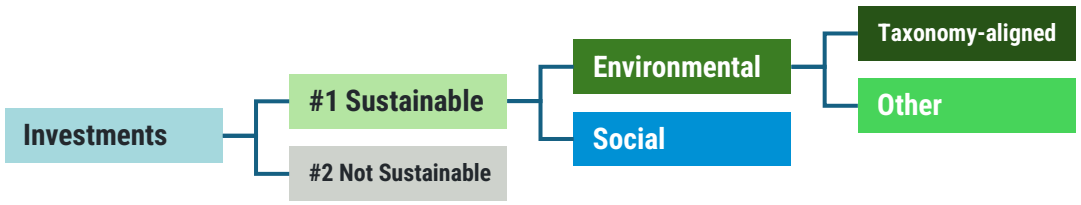
● ● [X] **Yes**

- ☐ It will make a minimum of **sustainable investments with an environmental objective: ___%**
  - ☐ In economic activities that qualify as environmentally sustainable under the EU Taxonomy
  - ☐ In economic activities that do not qualify as environmentally sustainable under the EU Taxonomy
- ☐ It will make a minimum of **sustainable investments with a social objective: ___%**

● ○ [ ] **No**

- ☐ **It promotes Environmental/Social (E/S) characteristics** and while it does not have as its objective a sustainable investment, it will have a minimum proportion of ___% of sustainable investments
  - ☐ With an environmental objective in economic activities that qualify as environmentally sustainable under the EU Taxonomy
  - ☐ With an environmental objective in economic activities that do not qualify as environmentally sustainable under the EU Taxonomy
  - ☐ With a social objective
- ☐ It promotes E/S characteristics, **but will not make any sustainable investments**

What is the asset allocation and the minimum share of sustainable investments?
(include only relevant boxes, remove irrelevant ones for the financial product)



#1 Sustainable covers sustainable investments with environmental or social objectives.

#2 Not Sustainable includes investments which do not qualify as sustainable investments

The SFDR requires disclosure and reporting of the proportion of commitment aligned with the sustainable investment objectives of the investment strategy. The visual below are from the template pre-contractual disclosure for the financial products referred to in Article 9.

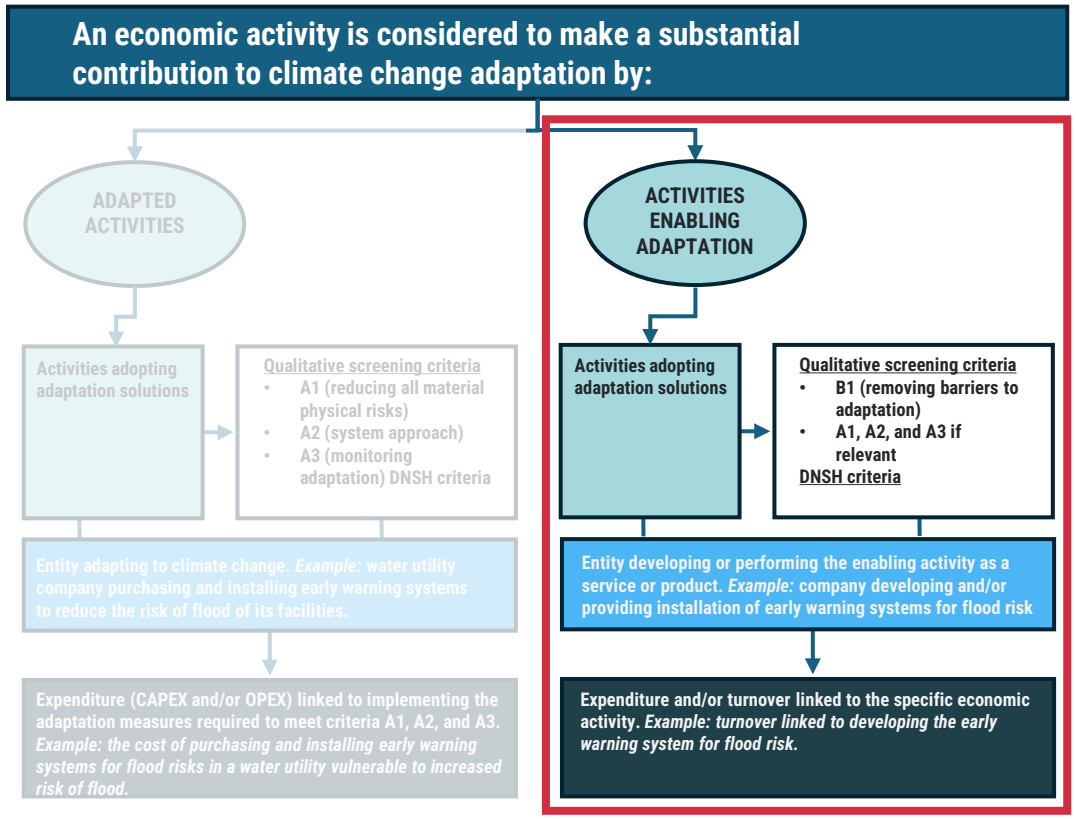
References

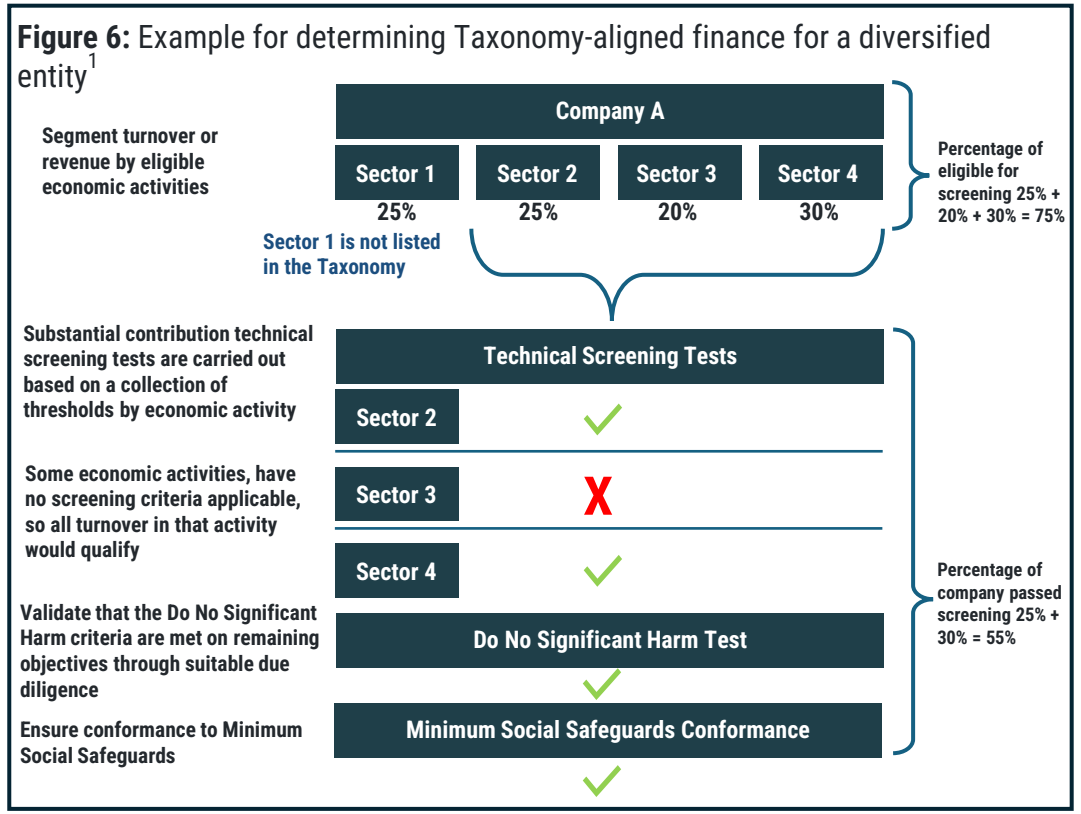
EU Sustainable Finance Disclosure Regulation (SFDR)

Template pre-contractual disclosure for the financial products referred to in Article 9, paragraphs 1 to 4a, of Regulation (EU) 2019/2088 and Article 5, first paragraph, of Regulation (EU) 2020/85

ii. Key Resources Underlying the Adaptation Solutions Framework

Definition and criteria for quantifying adaptation finance	References
Expenditures (CAPEX and/or OPEX – use of proceeds) or turnover linked to the qualifying activity enabling adaptation are the financial metrics indicated for accounting for adaptation finance. Eligibility under the Taxonomy, in fact, is to be assessed on an activity basis rather than on an entity basis. A key part of the assessment, therefore, includes defining what part of a corporate's activity can be defined as green (adaptation in the context of this document), and how that activity relates to the whole (see Figure 6).	South African Green Finance Taxonomy (2022).





Notes: (1) Currently, there is no regulating agency in South Africa concerning taxonomy-alignment, so it is a voluntary tool. (2) Approach outlined in the South African Green Finance Taxonomy based on UNEP-FI (2021), Testing the application of the EU Taxonomy to core banking products: High level recommendations.

iii. Glossary

Term	Definition
Adaptation	In human systems, it is the process of adjustment to actual or expected climate and its effects in order to moderate harm or take advantage of beneficial opportunities. In natural systems, adaptation is the process of adjustment to actual climate and its effects; human intervention may facilitate this.
Adaptive capacity	The ability of people, institutions, systems, and other organisms to adjust to potential damage, to take advantage of opportunities, or to respond to consequences.
Coping capacity	The ability of people, institutions, organisations and systems, using available skills, values, beliefs, resources and opportunities, to address, manage and overcome adverse conditions in the short to medium term.
Climate resilience[1]	Climate change resilience is the ability of a system to withstand climate-related shocks or stressors. It is the capacity of a system to cope with, or recover from, those effects, while retaining its essential original components. [The IPCC defines resilience as the capacity of interconnected social, economic and ecological systems to cope with a hazardous event, trend or disturbance, responding or reorganising in ways that maintain their essential function, identity and structure. Resilience is a positive attribute when it maintains capacity for adaptation, learning and/or transformation].
Exposure	The presence of people; livelihoods; species or ecosystems; environmental functions, services and resources; infrastructure; or economic, social or cultural assets in places and settings that could be adversely affected.
Hazard	The potential occurrence of a natural event or trend that may cause loss of life, injury, or other health impacts, as well as damage and loss to property, infrastructure, livelihoods, service provision, ecosystems and environmental resources.
Impact	The consequences of realized risks on natural and human systems, where risks result from the interactions of climate-related hazards, exposure, and vulnerability. Impacts generally refer to effects on lives, livelihoods, health and well-being, ecosystems and species, economic, social and cultural assets, services (including ecosystem services), and infrastructure.
Maladaptation	Maladaptive actions i.e., actions that may lead to increased risk of adverse climate-related outcomes, including via increased greenhouse gas (GHG) emissions, increased vulnerability to climate change, or diminished welfare, now or in the future.
Risk	The potential for adverse consequences for human or ecological systems. In the context of climate change impacts, risk results from the dynamic interactions between climate-related hazards with the exposure and vulnerability of the affected human or ecological system. In the context of climate change responses, risks result from the potential for such responses not achieving the intended objective(s), or from potential trade-offs or negative side-effects on, other societal objectives, such as the SDGs.
Physical climate risks[2]	Economic costs and financial losses that may arise from the increasing severity and frequency of extreme climate change-related weather events such as heatwaves, landslides, floods, wildfires and storms (so-called acute physical risks); or longer-term gradual shifts of the climate such as changes in precipitation and rising sea levels and average temperatures (so-called chronic physical risks or chronic risks).
Vulnerability	The propensity or predisposition to be adversely affected. Vulnerability encompasses a variety of concepts and elements, including sensitivity or susceptibility to harm and lack of capacity to cope and adapt. Vulnerability is widely understood to differ within communities and across societies, regions and countries, also changing through time.

Source: IPCC, 2022: Annex II: Glossary; (1) Joint MDB Assessment Framework for Paris Alignment; (2) BIS (2021), Climate-related risk drivers and their transmission channels

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Source: IPCC, 2022: Annex II: Glossary; (1) Joint MDB Assessment Framework for Paris Alignment; (2) BIS (2021), Climate-related risk drivers and their transmission channels

iv. References Material (1/2)

A&R Solutions Relevant Sources

- *ADB (2021), Digital Technologies for Climate Action, Disaster Resilience and Environmental Sustainability*
- Climate Tech Investment Network (CTIN) and Climate Collective's *Technology Research Briefs*
- CIFAR (2021), *Digital Finance for Climate Resilience Framework for Action*
- GC
- A (2021), *A Blueprint for Digital Climate-Informed Advisory Services: Building the Resilience of 300 Million Small-Scale Producers by 2030*
- Green Digital Finance Alliance (2021), *Green Fintech Classification*
- GSMA (2021), *Digital Innovation for Climate-Resilient Agriculture*
- GSMA *Digital solutions for climate resilience in agriculture*
- IPCC (2022), Climate Change 2022: Impacts, Adaptation and Vulnerability
- National Adaptation Plans per country: https://unfccc.int/topics/adaptation-and-resilience/workstreams/national-adaptation-plans
- National Adaptation Programs of Action - NAPA Priorities Database
- Nationally Determined Contributions per country https://unfccc.int/NDCREG
- Sustainable Energy for All (2022), *Chilling Prospects: Tracking Sustainable Cooling for All 2022*
- UN and FAO (2022), *Sustainable Food Cold Chains*
- UN Climate Technology Centre & Network, Connecting Countries to Climate Solutions
- UNEP DTU Partnership and UNFCC Secretariat (2021), *Technology Needs Assessment* by selected country (see also https://unfccc.int/ttclear/tna)
- UNFCC's Adaptation Knowledge Portal and Private Sector Initiative (PSI) database
- WMO (2021), *State of Climate Services – Water*; WMO (2022), *State of Climate Services – Energy*

Climate Investment Frameworks

- *Adaptation Solutions Taxonomy (2020)*
- *EU Taxonomy Regulation 2020/8252, Delegated Acts* and Amendment
- Joint MDBs (2022), *Joint methodology for tracking climate change adaptation finance*

iv. References Material (1/2)

A&R Impact measurement and management

- Adaptation and Resilience Investors Collaborative (2023), Development Finance Institutions and investors collaborate to advance adaptation and resilience
- ACT Adaptation Methodology (2022)
- Operating Principles for Impact Management
- Global Impact Investment Network (GIIN) and Impact Management Project, IRIS+ and the Five Dimensions of Impact
- Joint MDBs/IDFC (2019), *A Framework and Principles for Climate Resilience Metrics in Financing Operations*

Open-source tools to identify context-specific needs for A&R solutions (examples)

- **Water-related risks**: WWF's Water Risk Filter; WRI's Aqueduct
- **Wildfire risks**: ESA's World Fire Atlas
- **Sea Level risks**: NASA IPCC Sea Level Projection Tool - NASA Seal Level Portal
- **Drought risk**: East Africa Drought Watch, Monitor drought conditions in East Africa; Drought Impact Reporter (DIR)
- **Drought and flood risks**: Princeton Climate Institute (PCI) with University of Southampton and Princeton University, African Flood and Drought Monitor
- **Multi-climate hazards risks:**
  - Global Resilience Index Initiative
  - NGFS's Climate Impact Explorer by Climate Analytics
  - OS-C, Open-source Climate: Physical and Resilience tools

Investment Trends

- PWC (2023), *State of Climate Tech 2023, How can the world reverse the fall in climate tech investment?*
- Climate-KIC (2022), *Adapt, Mitigate and Grow.*

GARI

CRISP

Climate Resilience Investments in Solutions Principles (CRISP)