



Lisbon School
of Economics
& Management
Universidade de Lisboa

MASTER
INNOVATION AND RESEARCH FOR SUSTAINABILITY

MASTER'S FINAL WORK
DISSERTATION

**BRIDGING THE CLIMATE ADAPTATION FINANCE GAP: STRUCTURAL
BARRIERS TO CONTINUITY IN EU-FUNDED PROJECTS**

SARA HELENA NORONHA MALÓ

JANUARY-2026



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SUPERVISION:
PROFESSOR ANA MOUTINHO

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GLOSSARY

ANI Agência Nacional de Inovação. 10

EEA European Environment Agency. 28

EIC European Innovation Council. 8

EIT European Institute of Innovation & Technology. 8

ESG Environmental, Social and Governance. 15, 19, 24, 27

EURATOM European Atomic Energy Community. 5

FCT Fundação para a Ciência e a Tecnologia. 10

JEL Journal of Economic Literature. ii, iii

KICs Knowledge and Innovation Communities. 8

NAPs National Adaptation Plans. 16

NbS Nature-based Solutions. 12, 13, 25

NDCs Nationally Determined Contributions. 16

PPP Public–private partnerships. 25

UNEP United Nations Environment Programme. 16, 19, 22, 23, 52

ABSTRACT, KEYWORDS, AND JOURNAL OF ECONOMIC LITERATURE (JEL) CODES

Climate adaptation has become a growing priority in European policy, yet many EU-funded adaptation projects struggle to achieve continuity and scalability once public funding ends. This thesis examines the structural, institutional, and financial factors that limit the bankability and long-term sustainability of publicly funded climate adaptation projects in the European Union, with particular attention to non-market and nature-based solutions. Framed around the concept of continuity-by-design, the study explores how adaptation projects are designed, governed, and financed, and why private investment rarely follows initial public support.

Using a qualitative approach based on semi-structured interviews with key stakeholders, including project coordinators, policy actors, financial experts, and local authorities, the research analyses three Horizon Europe projects: CLIMATEFIT, RISE-IN, and CLIMINVEST. The findings show that barriers to bankability are largely systemic rather than technical, arising from fragmented governance, limited local institutional capacity, weak metrics for valuing adaptation benefits, and misalignment between public policy objectives and private investment logics. While hybrid approaches such as blended finance show promise, their effectiveness remains highly context-dependent and constrained by broader fiscal and geopolitical pressures. The thesis concludes that improving the bankability of climate adaptation requires stronger policy alignment, institutional anchoring, and early integration of financial considerations into project design.

Keywords: Climate Adaptation; Climate Adaptation Finance; Nature-Based Solutions; Bankability; Blended Finance; EU Climate Policy.

JEL Codes: Q54, Q56, Q58, G23, G24, O38.

RESUMO, PALAVRAS-CHAVE E CÓDIGOS JEL

A adaptação climática tornou-se uma prioridade crescente nas políticas europeias; no entanto, muitos projetos de adaptação financiados pela União Europeia enfrentam dificuldades em alcançar continuidade e escalabilidade após o término do financiamento público. Esta dissertação analisa os fatores estruturais, institucionais e financeiros que limitam a bancabilidade e a sustentabilidade a longo prazo de projetos de adaptação climática financiados publicamente na União Europeia, com particular atenção a soluções não orientadas para o mercado e baseadas na natureza. Enquadrado no conceito de continuidade por conceção (*continuity-by-design*), o estudo explora a forma como os projetos de adaptação são concebidos, governados e financiados, bem como as razões pelas quais o investimento privado raramente sucede ao apoio público inicial.

Recorrendo a uma abordagem qualitativa baseada em entrevistas semiestruturadas com atores-chave, incluindo coordenadores de projetos, decisores políticos, especialistas financeiros, a investigação analisa três projetos do programa Horizon Europe: CLIMATEFIT, RISE-IN e CLIMINVEST. Os resultados mostram que as barreiras à bancabilidade são em grande medida sistémicas, e não técnicas, resultando de governação fragmentada, limitada capacidade institucional a nível local, fracas métricas para valorizar os benefícios da adaptação e desalinhamento entre os objetivos de política pública e as lógicas de investimento privado. Embora abordagens híbridas, como o financiamento combinado (*blended finance*), revelem potencial, a sua eficácia permanece altamente dependente do contexto e condicionada por pressões fiscais e geopolíticas mais amplas. A dissertação conclui que melhorar a bancabilidade da adaptação climática requer um maior alinhamento de políticas, um reforço do enraizamento institucional e a integração precoce de considerações financeiras no desenho dos projetos.

Palavras-chave: Adaptação Climática; Financiamento da Adaptação Climática; *Bankability*; *Nature-Based Solutions*; Financiamento Híbrido; Política Climática da UE.

JEL Codes: Q54, Q56, Q58, G23, G24, O38.

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AI DISCLOSURE

This thesis was developed in full compliance with the academic integrity standards and procedures of the ISEG - Lisbon School of Economics and Management. In the interest of transparency, I hereby disclose that a limited number of artificial intelligence (AI) tools were used during the preparation of this work for clearly defined support purposes.

Specifically, AI-based tools were used to assist with linguistic refinement, including the rephrasing of selected sentences and paragraphs to improve clarity and academic tone, without altering the underlying meaning or analytical content. AI-assisted grammar and language tools were also employed to enhance readability and ensure consistency of expression across the text.

In addition, generative AI tools were consulted on a limited basis for brainstorming and structuring support, such as refining section flow or supporting the organisation of ideas. All substantive writing, critical analysis, interpretation of interview material, synthesis of findings, and conclusions are entirely my own work.

The use of AI tools did not compromise the originality, integrity, or academic rigor of this thesis. All academic sources were carefully reviewed and properly cited in accordance with established referencing standards. This work reflects a responsible and ethical approach to the use of AI in academic research, and full responsibility for its content is assumed by the author.

ACKNOWLEDGEMENTS

I would like to express my sincere gratitude to my supervisor, Professor Ana Moutinho, for her guidance, availability, and constructive feedback throughout the development of this dissertation. Without her, I would have surely been lost.

I am deeply grateful to my mom, for her endless patience, for the strength she passed on to me long before this work began, and for the steady presence that has shaped who I am. Her resilience, kindness, and unwavering support have been a constant reference, teaching me, often without words, what it truly means to persevere with grace.

A profound thank you goes my dad, who, despite the limited time he so often has, always found space to support me throughout this journey. His dedication, work ethic, and quiet commitment have been a constant source of inspiration and motivation, reminding me daily of the value of perseverance and care in everything one undertakes.

I am profoundly thankful to my sisters, for always standing by my side, no matter what; for being my guiding lights, and for never allowing me to feel alone, knowing they were with me. Growing up with them has been one of the greatest gifts of my life, and their presence continues to shape who I am every day.

My heartfelt gratitude to my niece, who, often without knowing it, was a source of joy, perspective, and motivation during the most intense moments of this process.

I am especially grateful to Jorge, whose presence provided steadiness during moments of doubt and uncertainty, and whose support gave me the confidence to keep moving forward when the process felt overwhelming. His patience and understanding were a constant source of balance throughout this journey. I want to thank him for being the calm that carried me forward, whose belief in me never wavered, even when mine did.

I would also like to thank Professor Jorge Pamies Teixeira, without whom this thesis would likely never have been completed. His perspective was a breath of fresh air at crucial moments, his contribution was a defining point in this thesis, bringing clarity, insight, and renewed direction to this work.

I would also like to thank family and friends for their constant support, patience, and encouragement throughout this journey. Their presence and understanding meant more to me than words can express.

Finally, I extend my sincere thanks to all the interviewees who generously shared their time, expertise, and professional perspectives. Their willingness to engage in open and thoughtful discussions greatly enriched this work.

1. INTRODUCTION

Climate change has emerged as one of the most pressing systemic challenges of the 21st century, with growing impacts on natural ecosystems, human health, and socio-economic systems worldwide (Intergovernmental Panel On Climate Change, 2014). It is defined as a sustained alteration in the state of the climate, identifiable through changes in the mean and/or variability of its properties, persisting over extended periods, typically decades or longer (Intergovernmental Panel On Climate Change, 2023). Scientific evidence demonstrates that climate change is no longer a future risk but a present reality: the World Health Organization estimates that between 2030 and 2050, climate change will contribute to approximately 250,000 additional deaths per year, linked to heat-related mortality, malnutrition, and the spread of climate-sensitive diseases (WHO, 2023).

As climate risks intensify, it has become increasingly evident that mitigation efforts alone are insufficient. Alongside emission reductions, robust adaptation strategies are required to manage unavoidable impacts and reduce vulnerability. Adaptation has therefore become a central concern for policymakers, particularly at local and regional levels, where climate impacts such as flooding, heat stress, and drought are most acutely experienced (Intergovernmental Panel on Climate Change, 2022).

This growing body of scientific evidence has progressively translated into policy responses at both international and European levels. Global climate governance over the past decade has been shaped by the adoption of the Paris Agreement in 2015, which established a shared international commitment to limit global warming to well below 2°C and pursue efforts to cap temperature rise at 1.5°C, while also strengthening adaptive capacity and climate resilience (United Nations Framework Convention on Climate Change, 2015). The Paris Agreement laid the foundation for national and regional climate strategies, signaling a shift towards long-term, systemic approaches to climate action. Within this global context, the European Union progressively translated international commitments into binding regional objectives (Kaur et al., 2023).

A key milestone in this process was the launch of the European Green Deal in 2019, which positioned climate action as a central pillar of the EU's long-term economic, social, and environmental strategy, integrating climate objectives across policy domains (European Commission, 2019). Beyond target-setting, the European Green Deal emphasises the creation of enabling conditions for the transition, including social fairness and targeted support for regions and populations most affected by climate change (European Commission, 2024d). This strategic orientation has been operationalised through regulatory and

investment instruments, most notably the European Climate Law, adopted in 2021, which establishes a legally binding objective of climate neutrality by 2050 (European Union, 2021). While these instruments have primarily focused on mitigation and industrial competitiveness, they reflect a broader EU approach aimed at aligning public intervention, private investment, and research priorities, an approach that is increasingly relevant for climate adaptation and resilience.

Within this policy framework, research and innovation have been positioned as key enablers of the green transition. This prioritisation is reflected in Horizon Europe, the EU's flagship research and innovation programme, under which approximately 35% of the total budget is explicitly allocated to climate-related objectives, including mitigation, adaptation, and resilience-building measures (European Commission, 2023). Through Horizon Europe and related funding instruments, the EU has sought to stimulate experimentation, knowledge generation, and the development of innovative solutions to address climate risks.

However, despite increasing policy attention and financial commitment, many publicly funded climate adaptation projects struggle to achieve continuity beyond their initial funding period. Once public support ends, projects frequently fail to scale, replicate, or attract follow-on investment, raising concerns about their long-term effectiveness and societal impact. This gap between policy ambition and project continuity points to deeper structural and financial challenges, particularly regarding the “bankability” of adaptation initiatives and their capacity to engage private capital (United Nations Environment Programme, 2024)(The Royal Institute of International Affairs, Chatham House, 2024). Adaptation benefits, manifesting as avoided losses, systemic risk reduction, and societal gains, remain poorly integrated into financial decision-making and asset valuation frameworks (Directorate-General for Climate Action, 2025)(Moser et al., 2019).

Against this backdrop, this thesis examines why EU-funded climate adaptation projects frequently demonstrate technical success yet fail to sustain outcomes once public support ends, pointing to structural and financial design factors that limit their bankability and long-term continuity. By combining policy analysis with qualitative interviews with key stakeholders involved in EU-funded initiatives, the research seeks to contribute to the clear understanding of the barriers that prevent adaptation projects from transitioning from publicly supported pilots to durable, scalable solutions capable of delivering sustained climate resilience.

This thesis is structured as follows: 2. State of The Art; 3. Research Questions and Hypothesis; 4. Methodology; 5 Results; 6. Discussion; and 7. Conclusions and Future Work.

2. STATE OF THE ART

Adapting to climate means anticipating the adverse effects of climate change (EEA, 2024a), which means, in the words of the Intergovernmental Panel on Climate Change (2022), "the process of adjustment to actual or projected climate and its impacts," incorporating activity to reduce vulnerability and increase resilience of human and natural systems. It is distinct from climate mitigation, which seeks to prevent or reduce greenhouse gas sources and emissions while increasing greenhouse sinks, by focusing on minimizing manmade impact on the climate system (EEA, 2024b). In the context of climate adaptation, the term "adaptation finance" is brought to light. The term has gained traction in recent years and is defined as "any financial service provided to an entity to enable adaptation and improve resilience" (UNDRR, KPMG, and Chartered, 2024), implying that it is funding projects and activities that help communities, businesses, and countries adapt to the effects of climate change.

2.1 GLOBAL CONTEXT

Over the past decade, investment in research and innovation has become a central pillar of national strategies to address long-term economic, technological, and societal challenges. As shown by trends in gross domestic expenditure on R&D as a share of GDP between 2014 and 2024 (illustrated in Figure 1), major economies such as South Korea, the United States, and China have steadily increased their R&D intensity, signalling a strong commitment to innovation-driven transformation, while the European Union exhibits more moderate growth. These global investment patterns are particularly relevant for climate adaptation, where effective responses depend on the ability to move from research and pilot initiatives toward scalable and durable solutions. In policy domains characterised by long time horizons, high uncertainty, and context-specific interventions, such as climate resilience, comparatively lower innovation intensity can contribute to persistent gaps between strategic objectives and implementation capacity (Hötte and Jee, 2022), providing an important global context for understanding current challenges in adaptation finance and project continuity (OECD, 2025b).

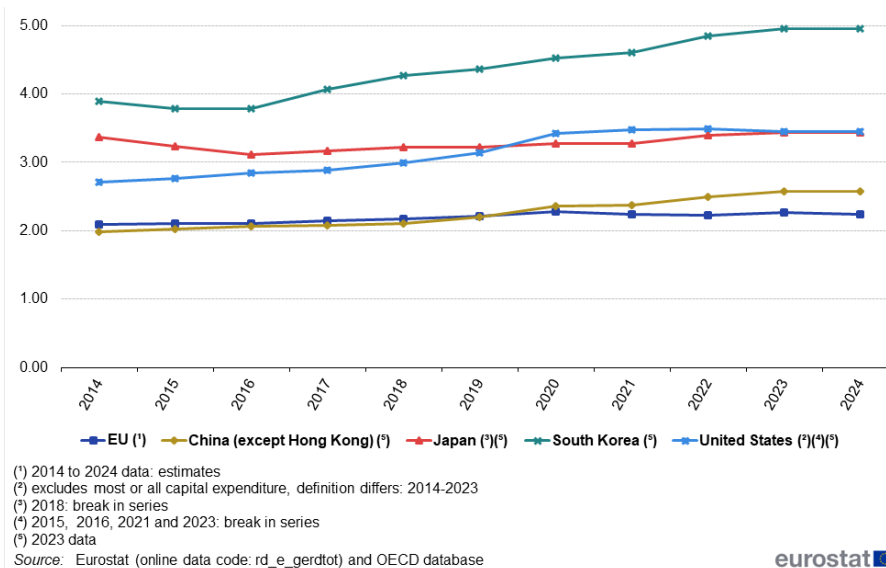


FIGURE 1: Gross domestic expenditure on R&D, 2014-2024 (% relative to GDP); y-axis represents the ratio of GERD to GDP is also known as R&D intensity.

Adaptation has gained increased recognition from policy makers, but financing remains significantly lacking. The Adaptation Gap Report conducted by United Nations Environment Programme, 2024 estimates that the annual adaptation finance gap ranges from USD 187 billion to USD 359 billion. Although international public adaptation flows to developing countries reached USD 28 billion in 2022 – the highest since the Paris Agreement – and this still falls far short of what is needed (United Nations Environment Programme, 2024).

Several major economies have begun to formalise adaptation strategies. Japan has embedded climate adaptation into its legal framework through the Climate Change Adaptation Act, emphasising risk assessment, disaster prevention, and coordination between national and local authorities, reflecting its exposure to extreme weather and natural hazards (Cabinet of Japan, 2018). China, through its National Climate Change Adaptation Strategy 2035, has adopted a state-led, long-term planning approach focused on climate risk prevention, infrastructure resilience, and sectoral adaptation across water, agriculture, and urban systems. Despite these advances, both cases illustrate that adaptation policy progress has not yet been matched by scalable, finance-ready mechanisms, underscoring the global challenge of translating adaptation priorities into sustained investment (Chinese Ministry of Ecology and Environment et al., 2022).

2.2 EUROPEAN LANDSCAPE

In the European context, the Align, Act, Accelerate report states that Europe is currently lagging in “both investments in and impact from research and innovation” (European Commission, 2024a). It is a substantial difference from when it was declared by experts that “Europe is a global scientific powerhouse” (European Commission and Directorate-General for Research and Innovation, 2017). Furthermore, the EU’s share of scientific publications worldwide decreased considerably, from 25.5% in 2000 to 18.1% in 2022 (European Commission, 2022a). The EU’s adaptation finance gap could reach €28 billion annually by 2030, even with Green Deal and cohesion funding in place (ECDPM, 2025), which only indicated the ever-growing risks of Europe’s ill-equippedness (EEA, 2024a) to climate change. Although strategies like the Just Transition Mechanism and EU Taxonomy aim to direct funds to green and climate-resilient development, cities and regions still face major difficulties in accessing implementation funding. For instance, 57% of city mayors surveyed by Eurocities in 2024, cited insufficient funding as the biggest barrier to adaptation measures. Mayor’s, therefore, emphasize that, in absence of additional financial and policy backing, municipalities will face considerable issues in their commitment to adopting sustainable practices (through climate-resilient public transportation networks) (Eurocities, 2025).

2.2.1 *Post-War Collaboration: A Trajectory of Institutional Growth*

European research policy developed progressively from fragmented, sector-specific cooperation toward more integrated and strategic frameworks. Early initiatives such as the European Coal and Steel Community and European Atomic Energy Community (EU-RATOM) focused primarily on energy security and industrial development, establishing the basis for transnational research collaboration (Reillon, 2016; European Union, 1958a). The Treaty of Rome and subsequent institutional reforms enabled the emergence of the Framework Programmes, which from FP1 onwards provided multiannual, cross-border funding for research and technological development (European Union, 1958b; Reillon, 2017). Legal consolidation through the Single European Act and later the Maastricht Treaty expanded the scope of EU research policy and gradually incorporated broader societal objectives, including environmental protection (European Union, 1986; European Union, 1992). However, despite incremental references to sustainability, energy efficiency, and environmental research across FP2 to FP5, climate change was not treated as a central or systemic priority. Instead, environmental concerns remained largely sectoral and subordinate to objectives of industrial competitiveness, technological advancement, and

market integration, limiting their strategic influence within early EU research programmes (Reillon, 2017; European Commission, 2007).

2.2.2 *The Foundations of Environmental Research: EU FP6 & FP7 (2002-2013)*

The gradual integration of sustainability into EU research funding became more explicit during the Sixth and Seventh Framework Programmes, although it remained largely sectoral rather than systemic. Under the Sixth Framework Programme (FP6, 2002–2006), sustainability was addressed primarily through the thematic priority “Sustainable Development, Global Change and Ecosystems”, which aimed to strengthen the scientific basis for environmental and climate-related policies (European Commission, 2002). Research efforts focused on areas such as renewable energy technologies, environmental risk assessment, atmospheric processes, and waste and resource management. While these activities represented an important step forward, they largely treated environmental challenges as discrete scientific and technological problems, rather than embedding sustainability across industrial, social, and economic domains.

The Seventh Framework Programme (FP7, 2007–2013) expanded both the scale and scope of environmental and climate-related research. Within the Cooperation pillar, “Environment (including Climate Change)” became a dedicated thematic area, supported by a substantially increased budget and a stronger emphasis on Earth observation, climate modelling, and environmental monitoring systems (European Commission, 2016). FP7 acknowledged the need for improved data, forecasting capabilities, and scientific evidence to inform climate policy, contributing to initiatives such as global and European Earth observation infrastructures. Nevertheless, sustainability within FP7 largely remained organised in thematic silos. Climate and environmental research were still insufficiently integrated with other policy domains such as transport, urban development, digital innovation, or social behaviour, and the systemic coupling of digitalisation and sustainability that would later define the “twin transition” was only emerging in a limited and exploratory form.

2.2.3 *From FP to Horizon: A Shift Toward Integration*

Horizon 2020 in 2017 and was introduced as a consolidated and simplified framework, integrating the scope of FP7, with a €75.6 billion budget (European Commission, 2017). Structured around three pillars, Excellent Science, Industrial Leadership, and Societal Challenges, it marked a shift toward a more integrated, mission-oriented approach to research and innovation, aimed at strengthening impact, policy alignment, and innovation

uptake across Europe (European Commission, 2024b). The programme mandated that at least 35% of its entire budget be dedicated to climate action. This period saw a shift toward challenge-driven innovation by reorganising research funding around broad societal objectives rather than narrowly defined technical improvements.

As Horizon 2020 neared its end, the European Commission launched the European Green Deal Call in September 2020 as an exceptional €1 billion funding initiative aimed at addressing both the climate emergency and the economic impacts of the COVID-19 pandemic (European Commission and Directorate-General for Research and Innovation, 2020). Unlike standard Horizon 2020 calls, it prioritised rapid deployment and tangible results, focusing on near-to-market solutions rather than early-stage research (European Commission and Directorate-General for Research and Innovation (European Commission), 2021). The call targeted key areas such as clean and circular industry, sustainable food systems, and biodiversity restoration, while strongly embedding digitalisation, through tools such as AI, digital twins, and supercomputing, as a core enabler of climate action. In doing so, it marked a transition from the exploratory logic of Horizon 2020 toward the more impact, and deployment-oriented approach later formalised under Horizon Europe (European Commission and Directorate-General for Research Innovation, 2021).

Building on the foundations laid by Horizon 2020 and the European Green Deal Call, Horizon Europe was launched as the EU's most ambitious research and innovation programme to date. With a budget of €95.5 billion, it addresses climate change, contributes to the UN Sustainable Development Goals, and increases the EU's competitiveness and growth (European Commission, 2021). With its significantly increased budget, the programme created new opportunities for European businesses, universities, and research institutions to form transnational partnerships and foster innovation-driven growth. The improved funding structure also translated into a higher average proposal success rate, increasing from 12% in Horizon 2020 to 16.4% under Horizon Europe, thus enhancing the programme's inclusivity and impact (European Commission, 2025b).

While Horizon Europe strengthens the EU's overall research and innovation capacity, the translation of this investment into climate adaptation outcomes remains uneven across Member States. As shown in Figure 2, national adaptation investment as a share of GDP varies significantly across Europe, indicating differing levels of political prioritisation and fiscal commitment to adaptation (Cortés Arbués et al., 2025).

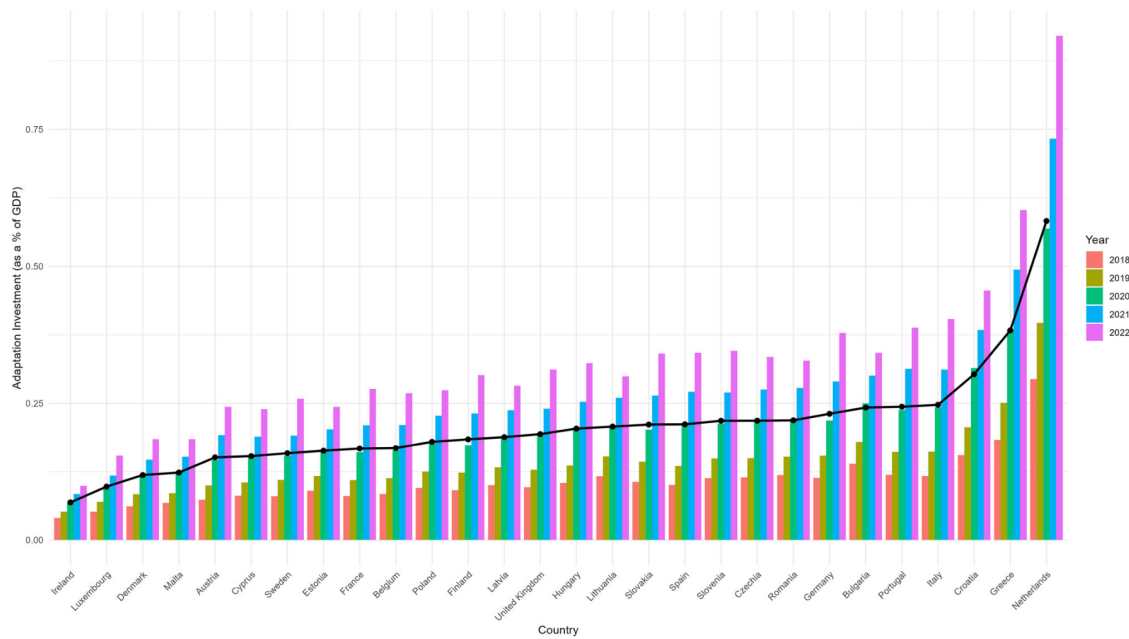


FIGURE 2: Total national adaptation investment as a percentage of GDP for the EU countries and the UK, over the period 2018–2022. The black dots represent the average total adaptation investment as a percentage of GDP over the five years for each country.

Despite these efforts, Europe continues to face difficulties in translating research outputs into market value. Only around one third of patents originating from public universities are commercially exploited, revealing persistent weaknesses in scale-up and market uptake, particularly when compared to international competitors such as the United States (European Commission, 2025b). Horizon Europe has sought to address this gap through instruments such as the European Innovation Council (EIC) Transition and EIC Accelerator, complemented by the European Institute of Innovation & Technology (EIT) and its Knowledge and Innovation Communities (KICs), which together promote a more integrated, mission-oriented pathway from research excellence to societal and economic impact.

Looking ahead, Horizon Europe’s successor, FP10, expected to launch in 2028, is intended to strengthen Europe’s competitiveness, strategic autonomy, and capacity to address complex societal challenges. With a proposed budget of approximately €175 billion, FP10 emphasises large-scale “moonshot” initiatives and administrative simplification, positioning research and innovation as central levers of Europe’s long-term strategic priorities (European Research and Innovation Area Committee, 2024; European Commission, 2025a).

2.2.4 *Portugal's Progress and Remaining Gaps*

Portuguese R&D shifted toward sustainability with the Portugal 2020 Partnership Agreement (PT2020), which aligned EU funding with climate action, resource efficiency, and low-carbon objectives (European Commission, 2014). Programmes such as PO SEUR and COMPETE 2020 supported environmental and climate-related investments, combining infrastructure-focused measures, particularly in energy efficiency, water management, and coastal protection, with innovation and competitiveness goals (European Union, 2014; PO SEUR, 2014). While PT2020 strengthened Portugal's environmental infrastructure and monitoring capacity, sustainability interventions remained largely sectoral, framing climate action primarily through efficiency and emissions reduction rather than systemic economic transformation.

Building on the efficiency-oriented investments of PT2020, Portugal's Recovery and Resilience Plan (PRR), under the EU's NextGenerationEU framework, marks a shift toward climate-driven economic transformation. Around 38% of the PRR allocation is dedicated to climate objectives, positioning climate action as a central pillar of national R&D and innovation policy (Agência Portuguesa do Ambiente, 2023; Governo de Portugal, 2021). The introduction of the "Agendas Mobilizadoras para a Inovação Empresarial" further reflects this shift by promoting large-scale consortia that link research, industry, and deployment in areas such as industrial decarbonisation and renewable energy (Governo de Portugal, 2021).

In 2024, Portugal recorded a significant increase in climate-related investment, with projects aligned with green objectives receiving over €1.3 billion from the European Investment Bank, accounting for 63% of its total investment in the country (EIB, 2025). This trend coincided with strong public support for climate action, as EIB survey data show widespread recognition of the importance of adaptation and the need for urgent investment (EIB, 2024). At the policy level, this momentum aligns with the launch of Portugal 2030, which implements EU Cohesion Policy through 12 programmes, including Sustentável 2030, a dedicated climate and sustainability programme mobilising more than €3.1 billion for decarbonisation, sustainable mobility, and resource efficiency (Portugal 2030, 2023; Portugal 2030, 2025). Unlike previous cycles, Portugal 2030 integrates climate objectives with innovation, digitalisation, and competitiveness, reflecting a more systemic approach to sustainability and resilience (Portugal 2030, 2022).

Building on growing public support and increased climate-related investment, 2025 marked a turning point in the governance of science and innovation in Portugal with the creation of AI² – Agência para a Investigação e Inovação. This reform integrates the

scientific mandate of Fundação para a Ciência e a Tecnologia (FCT) and the innovation instruments of Agência Nacional de Inovação (ANI), aiming to reduce institutional fragmentation, clarify responsibilities, and strengthen alignment across education, research, and innovation policies (Governo de Portugal, 2025b; Governo de Portugal, 2025a). While this reorganisation positions AI² as a central coordination hub for responding to national and EU priorities, its effectiveness will ultimately depend on whether improved governance translates into tangible outcomes, namely the scaling of innovation, market uptake, and sustained social and economic impact.

2.3 FRAMING THE ADAPTATION FINANCE GAP

Despite the growing urgency of climate consequences, adaptation funding is severely undeveloped compared to mitigation, resulting in a chronic and widening "adaptation finance gap." According to the 2024 Adaptation Gap Report (United Nations Environment Programme, 2024), private sector involvement is still restricted and inadequately monitored, and present adaptation financing flows are not just modest but also dominated by public sector contributions. Given that more than two-thirds of the stated adaptation needs are in non-market sectors that are often funded by public sources, such health, biodiversity protection, and disaster preparedness, this discrepancy presents a significant issue. The key measures listed in the National Adaptation Plans (NAPs) and Nationally Determined Contributions (NDCs) of the majority of nations will not be fulfilled in the absence of increased public investment or creative finance structures (United Nations Environment Programme, 2024).

This makes it unrealistic to expect private finance alone to close the gap. While private sector involvement is necessary, its contribution remains limited, often focused on protecting its own assets or developing marketable solutions in commercially viable sectors. As Climate Policy Initiative CPI (2024) points out, limited data and reporting on private sector adaptation efforts reinforce the widespread perception that viable business models for adaptation simply do not exist.

The financial challenge is enormous on a global scale. It is estimated that by 2030, it may cost up to 9 trillion USD annually to advance the green transition (Climate Policy Initiative CPI, 2025). When compared to the amount of capital that continues to flow into carbon-intensive industries, the EU alone needs an additional €370 billion in green investment over the next five years (Wullweber et al., 2025). However, the problem is not just with the available funds. As noted by Moser et al. (2019), the structure of finance frequently contradicts the essence of adaptability.

This misalignment is also highlighted by Hartwell et al. (2023), who argue that prevailing short-term, competitive funding models are poorly suited to the long-term and anticipatory nature of climate adaptation. The challenge is most pronounced in non-market sectors, where fragmented actors and limited monetisable outcomes make financing difficult, favouring large-scale, commercially oriented adaptation over decentralised or socially driven initiatives.

The adaptation financing gap is a concern of structure as well as volume. Much of what requires finance, particularly in non-market sectors or for the most vulnerable, lacks the characteristics that investors typically seek, such as revenue predictability, size, and predictable returns (Climate Policy Initiative CPI, 2024; United Nations Environment Programme, 2024). Limited data and reporting on private sector adaptation flows contributes to the idea that suitable business models are rare (Climate Policy Initiative CPI, 2024). This misalignment brings the idea of bankability to the forefront of the argument. Bridging the gap necessitates reconsidering what is investable, and for whom, while also recognising the need for structural innovation in funding methods (Wullweber et al., 2025).

Based on the UNEP Adaptation Gap Report 2025, Figure 3 below highlights the substantial gap between projected adaptation finance needs and current funding levels. While annual adaptation needs for developing countries, defined here as non-Annex II countries under the UNFCCC, are estimated at US\$310–365 billion by 2035, international public adaptation finance reached only US\$26 billion in 2023, with limited private mobilisation. Even under optimistic policy scenarios (including the collective target set by Multilateral Development Banks (MDBs), supranational financial institutions established by sovereign states to support developing countries in achieving development goals (Delivorias and Falkenberg, 2024), international financial institutions such as the World Bank and regional development banks that provide concessional finance to developing countries, financial flows remain well below estimated needs, underscoring the structural nature of the adaptation finance gap (United Nations Environment Programme, 2025).

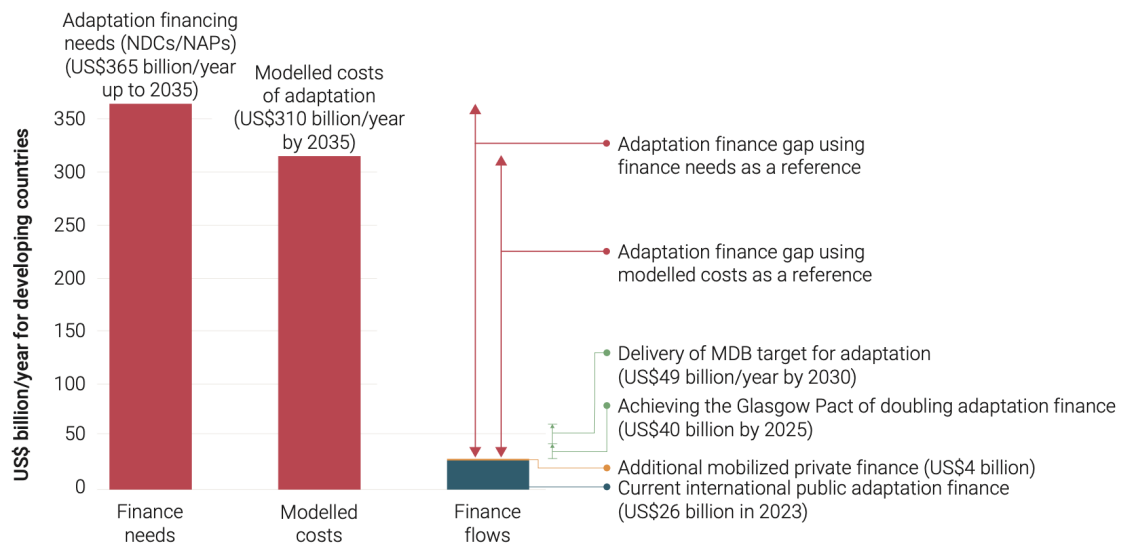


FIGURE 3: Comparison of adaptation financing needs, modelled costs and international public adaptation finance flows in developing countries.

2.4 BANKABILITY IN CLIMATE ADAPTATION AND NATURE-BASED SOLUTIONS

The term "Bankability" is defined as the capacity of an asset or intervention to attract investment by meeting profitability expectations and maintaining acceptable risk levels (Wullweber et al., 2025).

This typically implies that an investment can generate predictable cash flows, meaning that it is backed by strong governance and legal certainty, and fits within established investment frameworks. Projects that meet these criteria are more likely to secure funding from institutional investors, commercial banks, and blended finance vehicles. However, this paradigm has also led to the exclusion of critical climate adaptation and sustainability projects that, while socially beneficial, fail to meet traditional financial benchmarks. In many cases, adaptation efforts lack monetizable outcomes or rely on long-term public value creation, which rarely aligns with short-term investment horizons or profit motives.

At its core, bankability means that a project is attractive to investors, that it can generate returns, manage financial risks, and meet the expectations of funders. As Wullweber et al. (2025) put it, it's about whether a project fits into the current economic system well enough to be funded in the first place. And that's where the problem lies. Many of the solutions we need, especially in climate adaptation, aren't easily framed in terms of profit or immediate return. This creates a structural barrier: projects with immense public value often fall outside what's considered "bankable."

This is particularly true for Nature-based Solutions (NbS). According to United Na-

tions Environment Programme (2022), NbS are “actions to protect, conserve, restore, sustainably use and manage natural or modified terrestrial, freshwater, coastal and marine ecosystems, which address social, economic and environmental challenges effectively and adaptively, while simultaneously providing human well-being, ecosystem services, resilience and biodiversity benefits”. These solutions are increasingly seen as key to addressing the “triple challenge” of climate change, loss of biodiversity, and development (WWF, 2022). NbS also play a vital role in helping communities adapt to climate risks such as floods, heatwaves, and droughts (Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Performances, IPBES, 2019). On paper, these are the kind of solutions communities are in need of. But in practice, the struggle to attract funding is grand, especially from private investors.

Part of the reason is structural: most NbS projects are small, local, and tailored to a specific ecosystem. Their benefits are often public goods like cleaner air, biodiversity, resilience, which do not generate a financial return. As a result, most of the money that goes into NbS still comes from governments and philanthropic donors (WWF, 2025). Private capital remains largely on the sidelines. In fact, the Climate Policy Initiative CPI, 2024 found that limited data and inconsistent reporting reinforce the belief that there are simply no viable business models for adaptation and NbS, a narrative that becomes self-fulfilling when it keeps private capital away.

Even when there is interest from investors, turning that interest into investment is hard. Many NbS projects lack the initial funding needed to develop feasibility studies or business plans - key steps on the path to becoming “bankable” (WWF, 2022). Others face challenges in securing guarantees or co-investors, especially when they are small-scale or community-driven. Meanwhile, larger projects like natural flood defences or landscape restoration, often take years to show results and cannot easily compete with infrastructure investments that promise faster returns.

Despite these barriers, the momentum behind NbS is growing. There is a current needed for a shift in how investment “value” is defined. Bankability, as it is currently understood, excludes too many of the solutions we actually need. As Wullweber et al. (2025) argue, financing the green transition will require new frameworks, ones that allow for longer timelines, shared benefits, and public-private collaboration. It also means investing in the early stages of project development, building capacity on the ground, and supporting financial innovation that allows NbS to scale. Advancing the implementation of NbS will require adapting existing financial frameworks to accommodate their specific characteristics and public value, rather than expecting these interventions to conform to traditional investment logics.

2.5 CURRENT POLICY AND FUNDING PRIORITIES

The policy landscape surrounding climate adaptation in the European Union has evolved significantly in recent years, particularly under the Horizon Europe framework programme (2021–2027). One of its five mission areas, “Adaptation to Climate Change,” aims to support at least 150 regions and communities in becoming climate resilient by 2030. This mission reflects a growing recognition that adaptation must move beyond incremental improvements and instead foster systemic transformation that can be sustained beyond the limits of public funding.

The Horizon Europe call HORIZON-MISS-2022-CLIMA-01-02, titled “Unlocking of financial resources for investments into climate resilience,” was launched under the EU Mission on Adaptation to Climate Change to address the persistent financing gap in climate adaptation. The call aimed to strengthen the capacity of regional and local authorities to mobilise, combine, and access diverse public and private funding sources for climate resilience investments (European Commission, 2022b). In particular, it sought to support the development of investment-ready adaptation projects and the testing of innovative financing approaches capable of scaling climate resilience actions across Europe.

Under this call, the CLIMATEFIT project was funded as one of the first initiatives to operationalise the objectives of unlocking financial resources for climate resilience. Launched in September 2022, CLIMATEFIT focuses on integrating financial, governance, and risk considerations into the early design of local and regional climate adaptation projects. Rather than proposing standardised financial instruments, the project develops structured processes that support public authorities in translating adaptation measures into investment-ready initiatives. Through facilitated co-design mechanisms such as Local Resilience Task Forces, CLIMATEFIT aims to align public adaptation objectives with investor requirements from the outset, directly addressing the challenge of late and fragmented engagement of private finance and contributing to a continuity-by-design approach to climate adaptation (*ClimateFit* 2025) (Annex A).

A central funding mechanism under this mission is the call HORIZON-MISS-2024-CLIMA-01-06, which directly targets “testing and demonstrating transformative solutions to climate resilience in highly vulnerable regions and local communities” (European Commission, 2024c). This call identifies acute climate risks - such as floods, droughts, and water scarcity - as urgent priorities, and explicitly requests proposals that are capable of integrating cross-sectoral solutions while proving their scalability, replicability, and post-funding sustainability. These requirements strongly resonate with this dissertation’s focus on continuity-by-design and institutional anchoring.

Three projects have been funded under this call, each offering a different lens through which the EU's ambition for transformative adaptation can be observed.

By mapping the co-benefits of Climate Resilient Solutions (CRS) and matching them with suitable investment methods, RISE-IN presents the innovative idea of Bankability Readiness Level, creating a framework to assess the financial viability and appeal of CRS. In order to make sure that nature-based, ecosystem-based, and technology-based interventions that are co-designed with local communities meet investor expectations and have long-term financial sustainability, RISE-IN evaluates their investment potential using a systematic methodology (RISE-IN, 2025) (Annex B).

CLIMINVEST, on the other hand, focuses on operationalising the concept of bankable-by-design (BbD) for climate adaptation projects. By integrating financial risk assessment tools, Environmental, Social and Governance (ESG) reporting strategies, and a curated marketplace of investment-ready solutions, the project aims to lower barriers to private sector engagement. CLIMINVEST addresses one of the central critiques of adaptation finance: the lack of monetisable returns in non-market sectors, by supporting local governments and solution providers in proactively aligning their initiatives with private investment criteria (CLIMINVEST, 2025) (Annex C).

In addition to these projects, BLOSSOM creates connections between private finance ecosystems and local adaptation goals. Its method is tech-enabled and participatory, utilising digital twins, AI technologies, and Living Labs to jointly design and test business models that can turn adaptation concepts into viable, investable propositions. These models, which are first shown in a few Front Runner Cities, are then duplicated in other parts of Europe, providing avenues for the widespread adoption of customised, scalable solutions (BLOSSOM, 2025).

Together, these projects reflect a policy environment that is increasingly focused on bankability as a prerequisite for continued adaptation support. Each project interprets this challenge through a slightly different points of view, be it readiness levels, design methodologies, or participatory financing models, but all agree on one critical insight: sustained climate resilience is dependent not only on technical innovation, but also on institutional, financial, and governance architectures that can extend impact beyond the funding period.

3. RESEARCH QUESTIONS AND ANALYTICAL FRAMEWORK

This thesis seeks to understand the structural and financial barriers that prevent climate adaptation projects from achieving long-term viability and investment continuity after the end of public funding cycles, with particular attention to the EU context while drawing on evidence from developing country experience where the finance gap is most acute. While significant attention has been paid to climate mitigation finance, adaptation remains underfunded, fragmented, and largely dependent on public sector flows. As outlined in United Nations Environment Programme (UNEP)'s Adaptation Gap Report (2024), over two-thirds of adaptation priorities, many of which are embedded in Nationally Determined Contributions (NDCs) and National Adaptation Plans (NAPs), fall within sectors that struggle to generate bankable returns, thus complicating private finance mobilisation.

To explore this issue in greater depth, the following overarching research question guides the study:

Main Research Question:

What structural and financial design factors limit the bankability and long-term continuity of public-funded climate adaptation projects in the EU?

This core question is supported by the following sub-questions:

SQ1: What governance and financing models have been used in EU-funded adaptation projects, and to what extent do they promote post-funding scalability and investment continuity?

SQ2: Under what institutional and market conditions can nature-based adaptation projects become bankable, and how can financial frameworks be adapted to support these conditions?

SQ3: What role can hybrid approaches, such as blended finance, de-risking instruments, and impact-based procurement, play in bridging the adaptation finance gap for non-market solutions?

This is an exploratory and interpretive research effort, and as such it does not aim to formally test hypotheses. Rather, the goal is to generate grounded insights through the empirical analysis of real-world cases. The findings are expected to contribute to theory-building around continuity-by-design and public-private transition models in adaptation finance.

4. METHODOLOGY

This study takes a qualitative case study approach to better understand why so many publicly funded climate adaptation projects struggle to continue or scale once their initial financing ends. A qualitative method is especially well-suited to this kind of research because it allows for a deeper dive into complex, real-world issues, where not everything can be measured with numbers, and where listening to the people directly involved matters most, it gives the " 'human' side of the issue" (Oranga and Matere, 2023). It aligns with an interpretivist perspective, which values understanding social realities through the lived experiences and viewpoints of those who shape and are shaped by them (Bryman, 2016).

Focusing on the previously mentioned projects, the case study approach offers a way to closely examine how decisions were made, how funding and governance worked in practice, and how various stakeholders experienced the process.

4.1 RESEARCH DESIGN

A qualitative research design was adopted to investigate the structural and financial barriers that hinder the continuity of publicly funded climate adaptation projects. Given the contextual and institutional complexity of the topic, a case study approach was employed, focusing on two EU-funded Horizon Europe projects, RISE-IN, and CLIMINVEST, enabling an in-depth exploration of their financing pathways, governance dynamics, and institutional arrangements influencing post-funding continuity.

Semi-structured interviews were conducted to gather rich, qualitative insights from key informants across public, private, and research institutions. These interviews were designed to elicit both objective information, about financing mechanisms, investment conditions, and policy design, and subjective reflections, such as perceptions of risk, value attribution, and institutional readiness. The conversational format encouraged respondents to assume an active role as informants, providing nuanced understandings of the challenges faced in scaling adaptation finance.

Sampling for interviews was goal-directed, targeting individuals with strategic insight into the governance and funding structure of the project. Participants were approached through project contacts and provided with informed consent forms as well as questions in advance. Three representative scripts are provided (Annexes G, H, and I), reflecting distinct stakeholder profiles. The remaining interviews followed thematically aligned question sets, adapted to each interviewee's role, and are available upon request. Additional information

on the interviews can be found in Annex D through Annex I.

The analysis was supported by thematic coding of the data corpus, allowing for the identification of recurring patterns across cases, particularly those related to the transition from grant-based funding to investment-readiness. Desk research, funding reports, and relevant project documentation were also used to triangulate findings and enrich the empirical base. This combination of qualitative depth and contextual specificity aimed to produce grounded insights into the persistent gap between adaptation ambition and financial practice, especially in relation to nature-based solutions. Additional information on the thematic coding can be found in Annex F.

4.2 INTERVIEWEE SELECTION AND SAMPLING STRATEGY

The selection of interviewees followed purposive sampling, a non-random strategy used to deliberately include specific categories of cases within a sample. The selection was made based on the assumption that, given the researcher's theoretical understanding of the topic, certain individuals hold unique or particularly relevant perspectives on the phenomenon under study, and that their inclusion is therefore essential (Mason, 2002; Trost, 1986).

Interviewees were selected to reflect the key institutional positions shaping the lifecycle of EU-funded climate adaptation projects, mainly from RISE-IN and CLIMINVEST. This included project coordinators and lead researchers from Horizon Europe projects, who provided insight into project design choices, implementation constraints, and post-funding challenges; representatives from public funding and policy institutions, who offered perspectives on programme objectives, governance structures, and continuity expectations; and experts working at the interface of finance and climate policy, including private investors and financial-sector advisors, whose views were essential to understanding how adaptation projects are assessed against risk–return criteria. The inclusion of these roles allowed the research to capture how bankability is constructed, constrained, or rejected at different stages of the adaptation project pipeline, from policy formulation and project design to financing decisions and long-term sustainability.

At the same time, the selection process consciously avoided over-representation of any single stakeholder group. While project coordinators provide detailed knowledge of implementation challenges, their perspectives were complemented by those of policymakers, funding agency representatives, and private investors, whose incentives and constraints differ significantly. This triangulation was essential to avoid a project-centric bias and to capture the structural misalignments between public funding logics and private investment

expectations.

The interview sample comprised key actors occupying strategic positions across the European climate adaptation finance ecosystem. These included:

- Professor Laura Grassi from Politecnico di Milano, coordinator of the RISE-IN project, who provided insights into the regulatory and financial misalignment affecting nature-based adaptation.
- Carla Gonçalves, Executive Director of Centro do Clima, a RISE-IN partner, who contributed a practitioner perspective on institutional capacity and project continuity at local and national levels.
- John Soldatos, proposal author of CLIMINVEST, who discussed performance-based frameworks and bankability-by-design approaches.
- Kostas Metaxas, an asset manager representing private investor views on risk–return logic and ESG constraints.
- Gabriela Prata Dias, an expert in climate finance and sustainability (with experience in UNEP and international policy implementation), contributed perspectives on financial literacy, monitoring systems, and public–private engagement mechanisms.
- Paul Smith, a climate risk and climate adaptation expert at UNEP Finance Initiative offered insights into how adaptation is perceived and operationalised by banks and insurers.

The sample was complemented by three anonymous experts, providing a broad institutional and financial perspective on adaptation finance globally. While participants are not individually identified, their perspectives and inputs were integrated into the analytical process in accordance with confidentiality requirements.

All interviewees who consented to disclosure are described in detail in Annex E, along with their institutional affiliations, ensuring transparency while keeping the main body of the thesis focused on analytical synthesis rather than descriptive profiling. Overall, the interview selection strategy was designed to balance relevance, diversity of perspective, and analytical coherence, supporting a qualitative examination of adaptation finance challenges that are systemic rather than project-specific.

4.3 DATA ANALYSIS STRATEGY

Interview transcripts and project documents were analysed using thematic content analysis, following Braun and Clarke (2006) six-phase framework:

1. Collect the data: All collected materials will be treated collectively as the study's data set.
2. Engage with the data: Develop a deep familiarity with the data by repeatedly reviewing transcripts, revisiting audio recordings, and recording preliminary observations and impressions.
3. Code the extracts from data: Construct preliminary codes and descriptive labels that capture significant features of the data in relation to the research questions. (Additional information can be found in Annex F).
4. Generate the extracts from data: Recognize underlying ideas and recurring concepts that shape the meaning conveyed within the data.
5. Conceptualize the themes from the categorized coded extracts: Identify themes as coherent and meaningful patterns across the data corpus, and articulate the essence of each theme by linking it to relevant concepts and findings from existing literature.
6. Contextualize and represent the findings: Combining analysis with illustrative examples to build a compelling and well-supported account of the findings.

Triangulation was ensured by comparing findings across data sources (interviews, documents, literature). Reliability was enhanced through memoing and maintaining coding audit trails.

4.4 ETHICAL CONSIDERATION

The research complies with ISEG - Lisbon School of Economics and Management's ethical guidelines for research involving human subjects. Participants will receive detailed information sheets and sign informed consent forms. Interviews will be anonymized and stored in encrypted formats, with data handling adhering to GDPR standards.

Given the participatory nature of the case, the researcher acknowledges their own position as an insider to the research context. Reflexivity will be maintained through systematic journaling, critical reflection on assumptions, and explicit attention to power dynamics and representation of stakeholder voices (Berger, 2015).

4.5 LIMITATIONS

While this study offers in-depth insights into the financial and institutional dynamics shaping the continuity of climate adaptation projects, several limitations must be acknowledged. Firstly, the qualitative and case-based nature of the research limits the generalisation of the findings. The aim was not to produce statistically representative conclusions but to generate rich, context-specific understanding of how financing challenges, particularly those related to bankability.

Secondly, the availability and scope of data posed some constraints. Given the nascent and evolving nature of adaptation finance, comprehensive and up to-date data, particularly regarding private sector flows and long-term project impacts, remains limited or fragmented. This may have affected the depth of certain empirical observations, particularly when evaluating financial continuity or tracking the life-cycle of specific initiatives.

Moreover, access to interviewees was constrained by time, institutional availability, and the sensitivities surrounding financial information. As a result, some stakeholder perspectives could be underrepresented, potentially narrowing the scope of the findings.

Finally, while the thematic analysis followed a rigorous coding process, interpretative bias remains an inherent risk in qualitative research. Efforts were made to mitigate this through data triangulation and transparency in methodological steps; however, the researcher's positionality may have influenced interpretation, particularly in drawing connections between narrative patterns and institutional behaviours.

5. RESULTS

To investigate the structural and financial factors limiting the bankability and long-term continuity of publicly funded climate adaptation projects, as previously stated, this research adopted a qualitative approach based on semi-structured interviews with project coordinators, institutional partners, policy experts, and private-sector actors directly involved in EU-funded adaptation initiatives, such as experts from the UNEP Finance Initiative and the UNEP Copenhagen Climate Centre. Interviewees were selected for their involvement in the design, implementation, and governance of projects such as RISE-IN and CLIMINVEST, as well as for their experience in financial regulation, innovation policy, and private investment.

Across interviews, respondents consistently highlighted that barriers to continuity and scalability are not attributable to a single factor, but rather emerge from the interaction between institutional design, financing logics, governance capacity, and the characteristics of adaptation interventions themselves.

5.1 INSTITUTIONAL AND GOVERNANCE CONSTRAINTS

Several interviewees reported that EU-funded adaptation projects tend to perform effectively during their funded implementation phase but face significant challenges once public funding ends. Carla Gonçalves, collaborator in the project RISE-IN, noted that project teams are often hired specifically for execution, meaning that “this knowledge is often lost” at project completion, while organisations are structurally incentivised to prioritise securing new funding rather than consolidating existing solutions. This dynamic was described as reinforcing a cycle in which continuity is rarely embedded institutionally.

An interviewee with experience in public research funding agencies further emphasised that continuity is constrained by systemic fragmentation within the European research and innovation landscape, noting that “while Horizon Europe is highly visible, it represents less than 15% of total R&I funding in the EU, with the remainder distributed across national and regional systems that are often weakly aligned.” According to this perspective, such fragmentation limits the absorption of project outcomes into domestic funding structures and weakens institutional memory. It was also stressed that continuity should not be assumed as a universal objective, observing that “neither all projects have to continue, nor do they all deserve that continuity.”

At the local level, governance capacity was identified as a decisive but uneven factor.

Interviewees described strong regional asymmetries in administrative resources, technical expertise, and cross-sectoral coordination. While scientific excellence can emerge in less economically developed regions, limited administrative capacity and siloed funding structures were reported to undermine long-term project survival.

An interview with Paul Smith, climate risk and climate adaptation expert working with financial institutions through the UNEP Finance Initiative, highlighted a structural disconnect between the recognition of climate adaptation risks and concrete financial engagement. Smith noted that adaptation has become “the number one topic for banks worldwide” in terms of strategic concern, yet this has not translated into widespread financing activity. He described a “huge disconnect between what financial institutions see as important and what they are actually able and willing to do,” pointing to short lending horizons, limited client demand, and difficulties in translating climate impacts into financial materiality. According to Smith, while adaptation has become a strategic priority for banks globally, a disconnect persists between institutional awareness and actual financing activity, particularly in short-term commercial lending, where, as Smith notes, banks “don’t see the risks being that high within that time horizon, yes, maybe in 20 years, but right now it’s not so easy.” He further emphasised that adaptation investments face persistent barriers related to data availability and modelling, stating that “translating climate risks into financial risks is still very difficult,” particularly for smaller institutions with limited analytical capacity. These constraints contribute to a situation in which awareness of adaptation risks exists, but viable financial responses remain limited.

5.2 FINANCIAL DESIGN AND BANKABILITY CHALLENGES

A dominant finding across interviews was the structural misalignment between climate adaptation projects, particularly nature-based solutions (NbS) and existing financial systems. Professor Laura Grassi, coordinator of RISE-IN and Head of the Research Center on Financial Innovation at Polytechnic of Milan, explained that NbS “pose new challenges that cannot somehow be solved with the current financial products and services that institutions offer.” Drawing on her experience in financial regulation, she highlighted that adaptation interventions are long-term, site-specific, and difficult to monetise, making them incompatible with prevailing risk models and regulatory frameworks. As she stated, “there is almost nothing” currently in place to enable meaningful private-sector engagement in financing NbS.

This mismatch was echoed by private-sector and finance experts. An expert actively involved in the design and implementation of climate adaptation projects described bank-

ability primarily as a function of “risk and return,” noting that adaptation projects face additional layers of risk related to long time horizons, policy uncertainty, and benefit delivery. From this perspective, adaptation remains peripheral compared to mature investment domains such as renewable energy, which benefit from standardisation and proven financial performance.

Private investors reinforced this assessment. Kostas Metaxas, an asset manager advising high-net-worth clients, stated that demand for sustainability-oriented investments remains limited, observing that “out of 100 clients, I have one client that’s interested to pick portfolios that are ESG compliant.” He described sustainability investments as subject to an “ESG drag,” resulting from a reduced investable universe and lower expected returns.

Metaxas highlights a fundamental misalignment between conventional investment frameworks and the financial profiles of climate adaptation and sustainability projects. It was emphasised that “investors love to have an idea of return on investment,” typically grounded in well-established financial instruments such as bonds and equities, where returns are structured through regular coupons, dividends, or capital appreciation. As noted, investors are largely “wired in this type of logic,” relying on predictable and clearly defined revenue streams. By contrast, adaptation and sustainability projects were described as generating predominantly indirect or contingent forms of value, for which “the revenue is not clear.”

Co-benefits were highlighted as a relevant feature of climate adaptation investments. John Soldatos described co-benefits as cases in which “one infrastructure gives you multiple benefits,” noting that a single project can simultaneously deliver climate resilience and additional functions, such as energy generation or other infrastructure services. He stated that adaptation measures are often implemented alongside investments that would occur regardless, with resilience outcomes providing added value. According to Soldatos, this additional value “adds one more line to the bottom line,” which he noted is contributing to growing interest from financial actors.

5.3 HYBRID APPROACHES AND ENABLING MECHANISMS

Despite these constraints, interviewees identified several mechanisms that could support improved alignment between public objectives and financial viability. Gabriela Prata Dias, Head of Section on Business Models and Finance and Head of Energy Efficiency at UNEP Copenhagen Climate Centre, emphasised the importance of monitoring and verification systems, stating that “one thing is what we imagine and design at the moment

of investment, but when confronted with reality it often turns out differently.” Continuous monitoring was described as enabling projects to return “to the beginning and see where things could have been improved,” thereby supporting credibility and learning.

Capacity building and training emerged as another recurring theme. Prata Dias noted that limited financial literacy within public authorities remains a major bottleneck, remarking that “it is often easier to get a loan to renovate a kitchen than to restore a forest area.” Several interviewees reported that public actors frequently lack the tools to assess costs, risks, and financing options for adaptation investments.

Blended approaches involving early public–private engagement were also highlighted. Prata Dias argued that bringing public and private actors together “from the beginning” can help maintain interest, ensure shared responsibility, and support long-term maintenance. However, Grassi cautioned against applying conventional public–private partnership models to NbS, noting that such projects “do not generate cash flows,” and therefore require “a new way of Public–private partnerships (PPP) [...] adapted to the specific features of NbS.”

Kostas Metaxas emphasised that private investors are unlikely to engage in climate adaptation projects without explicit public risk-sharing mechanisms. He stated that investors “need to have some sort of soft guarantee that the government will step in,” including forms of subsidy or public assumption of first loss, in order to participate. According to Metaxas, such arrangements are necessary to give investors the confidence to engage with projects characterised by high uncertainty and unclear revenue structures, noting that without this support “it is very difficult” for private capital to commit. From his perspective, projects aiming to attract private capital require clearer ownership structures, early investor involvement, and a focus on clearly defined problems that can be translated into measurable financial outcomes. As he noted, “if you put a real private investor that thinks from a business perspective, then the scope of the project will be tuned towards a real problem you need to solve.”

Projects such as CLIMINVEST were reported to operationalise these insights by focusing on performance-based frameworks, measurability, and risk reduction. John Soldatos explained that the project aims to make adaptation “more attractive to private funders” by improving risk–return profiles and enabling performance to be “measured and tracked,” thereby building investor confidence. However, he acknowledged that private engagement cannot be guaranteed, stating that “we cannot oblige the private investor to engage.”

5.4 REGULATION, POLICY CONTEXT, AND FISCAL PRESSURE

Finally, interviewees consistently stressed that regulation alone is insufficient to mobilise private finance for adaptation. A climate finance expert stated that “if there’s no business case for the activity that needs to be financed, no amount of regulation is going to solve that situation.” Adaptation was distinguished from mitigation, as it is “less about correcting externalities and more about how you adapt to unchecked externalities,” making return generation structurally more complex.

Several respondents also pointed to growing fiscal pressure as a contextual constraint. Rising security and defence priorities were reported to be diverting public resources away from adaptation, reinforcing uncertainty and limiting the ability of public authorities to play a catalytic role. As an adaptation projects expert noted, financial institutions currently approach adaptation “not necessarily as a business opportunity yet but rather as a reputational opportunity,” underscoring the fragility of current engagement.

6. DISCUSSION

This discussion interprets the empirical findings presented in the Results chapter in relation to the central research question: What structural and financial design factors limit the bankability and long-term continuity of publicly funded climate adaptation projects in the EU? Drawing on interview evidence from EU project coordinators, institutional actors, and private investors, the analysis reveals that limitations to continuity and bankability do not stem from a single failure, but from a systemic misalignment between public policy objectives, project design logics, and prevailing financial evaluation frameworks.

6.1 STRUCTURAL MISALIGNMENT BETWEEN ADAPTATION OBJECTIVES AND FINANCIAL LOGIC

A consistent theme across interviews is the structural incompatibility between the characteristics of climate adaptation projects, particularly nature-based solutions, and conventional financial models. As articulated by coordinators of RISE-IN and CLIMINVEST, adaptation interventions are inherently long-term, context-specific, and oriented toward avoided losses or systemic resilience rather than direct revenue generation. These features contrast sharply with the risk–return logic that underpins private investment decision-making, which prioritises predictable cash flows, short-to-medium time horizons, and standardised asset classes.

This misalignment was further reinforced by private-sector perspectives. The scepticism expressed by investors, particularly regarding the limited demand for ESG-aligned portfolios and the perception of “ESG drag,” illustrates that adaptation projects remain marginal within mainstream investment strategies. From this standpoint, sustainability or resilience benefits alone are insufficient to justify investment unless they are translated into financially legible value propositions. This finding aligns with OECD evidence indicating that blended finance instruments are most effective when public intervention directly improves the risk–return profile of investments, rather than relying on normative or reputational incentives alone (OECD, 2025a).

The results also indicate a persistent mismatch between the risk profiles of climate adaptation projects and the expectations of private investors. Interview evidence shows that, in the absence of predictable revenue streams, adaptation initiatives struggle to meet conventional investment criteria, particularly in terms of downside risk protection. In this context, public risk-sharing mechanisms, such as subsidies, guarantees, or first-loss ar-

rangements, emerge as enabling instruments rather than market distortions. They provide a degree of confidence that can compensate for uncertainty, long investment horizons, and benefits that materialise primarily through avoided losses and enhanced resilience. These findings reinforce the view that private engagement in adaptation is unlikely to scale without credible public backstopping. More broadly, they suggest that blended finance structures must be embedded early in project design to align adaptation objectives with financial decision-making and to support the transition from short-term public interventions to durable, investment-ready solutions. This perspective aligns with OECD blended finance case studies, which show that successful mobilisation of private capital typically occurs in contexts where public actors absorb early-stage risks, provide guarantees, or commit to long-term demand through policy instruments or public procurement (OECD, 2025a). Where such conditions are absent, as is often the case for local adaptation projects, private finance engagement remains limited.

6.2 INSTITUTIONAL DESIGN, CONTINUITY-BY-DESIGN, AND ENABLING FINANCIAL MECHANISMS

Beyond financial logic, the results highlight institutional design as a critical determinant of project continuity. Interviewees consistently reported that EU-funded projects tend to be optimised for delivery within fixed funding cycles, rather than for long-term institutional embedding. Temporary staffing arrangements, project-based governance structures, and fragmented funding ecosystems create discontinuities once EU support ends. As noted by institutional actors, organisations are often structurally incentivised to pursue new funding opportunities instead of consolidating or scaling existing solutions.

This finding points to a gap between the EU's stated ambition for transformative, mission-oriented adaptation and the operational realities of project implementation. While Horizon Europe missions explicitly emphasise scalability, replication, and long-term impact, continuity is rarely embedded as a design requirement at institutional or financial levels. In this sense, continuity-by-design remains more aspirational than operational, echoing OECD observations that many publicly supported projects lack clear post-funding transition pathways to domestic budgets, private finance, or hybrid governance arrangements (OECD, 2025a).

A recurring insight across the interviews, also reflected in recent analyses by the European Environment Agency (EEA), is that long-term continuity often depends on the capacity of public institutions to actively shape the financial conditions under which adaptation projects operate. Many adaptation initiatives are perceived by private actors as

carrying high risk or offering returns that materialise too slowly, particularly in the case of nature-based and resilience-oriented interventions. In these situations, continuity cannot rely on market forces alone, but requires public-sector mechanisms that absorb part of the risk or improve the overall risk–return profile. This may involve the public sector bearing first losses or providing guarantees, thereby lowering perceived risk and signalling long-term institutional commitment. Where such mechanisms are absent, adaptation projects tend to remain confined to short-term public funding cycles, limiting their ability to scale or attract follow-on investment.(EEA, 2026).

6.3 BANKABILITY-BY-DESIGN AND THE LIMITS OF CURRENT APPROACHES

The interview evidence suggests that recent EU project outcomes, such as RISE-IN’s Bankability Readiness Level or CLIMINVEST’s performance-based frameworks, represent important steps toward addressing these gaps. By focusing on measurability, risk reduction, and financial signalling, these projects attempt to translate adaptation benefits into forms more compatible with investor decision-making. However, interviewees also acknowledged that such tools remain exploratory and cannot, on their own, overcome deeper structural constraints.

Beyond that, a recurring insight across experts is the importance of engaging private investors early in the project lifecycle, rather than only once technical designs and funding structures have already been defined. Early engagement allows investment criteria, risk perceptions, and return expectations to inform project design from the outset, reducing the misalignment between public objectives and financial logic that often emerges at later stages. Several interviewees noted that when financial actors are consulted only after projects are fully specified, opportunities to adjust scope, structure, or revenue logic are largely lost, limiting bankability and follow-on investment. Embedding investor perspectives at an early stage therefore supports a continuity-by-design approach, in which adaptation projects are shaped with clearer pathways to long-term financing.

The findings also underscore the central role of monitoring and verification mechanisms in strengthening the continuity and financial credibility of climate adaptation projects. Interview evidence consistently highlights that project performance often diverges from initial assumptions once implementation begins, yet many initiatives lack systematic tools to track outcomes over time. Strengthening monitoring frameworks is therefore essential in order to have clear, credible, and comparable information available, both to inform the design and improvement of future projects and to provide private investors with the transparency needed to assess performance, risk, and long-term value.

This concern is reflected in recent European Commission’ Reflection Group analysis, which notes that without robust monitoring and verification mechanisms, investors are unable to quantify the benefits of adaptation measures or integrate them into asset valuations. As a result, improved resilience is not reflected in market value, making it difficult to justify higher upfront costs. This challenge is particularly pronounced for nature-based solutions, whose value is largely derived from avoided losses and co-benefits that remain difficult to monetise within conventional financial frameworks (Directorate-General for Climate Action, 2025). OECD similarly stress that blended finance mechanisms require strong public-sector capacity to design, monitor, and manage complex financial structures (OECD, 2025a). Without sustained investment in capacity building, monitoring systems, and data infrastructures, adaptation projects struggle to meet even the minimum conditions for financial engagement.

6.4 POLICY CONTEXT AND EMERGING CONSTRAINTS

Another key finding concerns the role of governance capacity at national and local levels. Interviewees highlighted significant asymmetries in administrative expertise, financial literacy, and data availability across regions. Even where political willingness exists, public authorities often lack the tools to assess adaptation costs, structure financing options, or communicate impacts in ways that resonate with financial actors. This reinforces the notion that bankability is not solely a project-level attribute, but an outcome shaped by broader institutional ecosystems.

The findings suggest that climate adaptation continues to be assessed predominantly through narrow economic and financial lenses, despite its fundamentally broader value proposition. Adaptation projects often generate benefits that do not translate into direct revenues, but instead materialise through avoided losses, reduced systemic risk, and wider societal gains such as improved public safety, ecosystem services, and social well-being. These value dimensions are central to the public rationale for adaptation, yet remain weakly integrated into financial decision-making and asset valuation frameworks. As a result, projects that deliver substantial societal value may still appear financially unattractive when evaluated solely through conventional risk–return criteria. This disconnect reinforces the need for policy frameworks that explicitly recognise co-benefits and resilience outcomes as legitimate value components, and that support financial structures capable of internalising these benefits. Without such recognition, adaptation risks remaining structurally disadvantaged relative to mitigation or revenue-generating investments, even in policy environments that formally prioritise climate resilience.

Finally, the discussion must be situated within the current policy and fiscal context. Interviewees repeatedly pointed to increasing competition for public resources, driven by rising security, defence, and competitiveness priorities. This shift risks constraining the catalytic role of public finance in adaptation, at a time when private investment remains hesitant. As noted by a climate finance expert, regulation alone cannot compensate for the absence of a credible business case, particularly in adaptation domains where benefits are diffuse, long-term, and collective.

Taken together, the results suggest that the limited bankability and continuity of EU-funded adaptation projects reflect not a lack of innovation or ambition, but a structural gap between problem diagnosis and solution deployment. While EU policy frameworks have become increasingly sophisticated in defining climate risks and adaptation needs, less emphasis has been placed on operationalising financial and institutional mechanisms capable of sustaining solutions beyond project lifetimes. Addressing this gap requires moving from adaptation as project toward adaptation as system, where financial design, governance structures, and policy instruments, developed and aligned by public authorities, EU institutions, and private financial actors, are coordinated from the outset with long-term continuity objectives.

7. CONCLUSIONS AND FUTURE WORK

This dissertation contributes to an emerging European and international policy and research agenda on climate adaptation finance by offering a structured examination of how structural, institutional, and financial design features condition the long-term continuity and bankability of publicly funded adaptation projects. By combining qualitative evidence from EU-funded initiatives with insights from key policy, project, and financial actors, this thesis helps to clarify why adaptation projects continue to struggle in transitioning from publicly supported pilots to durable, investment-ready solutions.

Rather than identifying a single dominant barrier, the findings demonstrate that the limited bankability and long-term continuity of EU-funded climate adaptation projects emerge from the interaction between institutional design, governance capacity, and prevailing financial logics. Across the interviews, a consistent pattern emerges: these projects often perform effectively during their funded implementation phase but struggle to persist once EU public support ends. Weak institutional anchoring, insufficient monitoring and verification mechanisms, and the late engagement of private financial actors constrain learning, accountability, and the ability to demonstrate performance over time. While regulation provides an essential enabling framework, the results confirm that regulatory support alone cannot compensate for the absence of financial structures adapted to the specific characteristics of climate adaptation.

The findings further show that adaptation projects challenge conventional risk–return frameworks, as value is frequently generated through avoided losses, risk reduction, and systemic resilience rather than direct or short-term revenue streams. These characteristics create a structural misalignment with prevailing investment models, not due to a lack of relevance or urgency, but because benefits are long-term, context-specific, and difficult to monetise. Addressing this misalignment requires financial and policy frameworks that move beyond traditional investment metrics, incorporating public guarantees, blended finance instruments, outcome-based approaches, and robust monitoring systems. At the same time, the current geopolitical context, marked by rising security and defence expenditures, intensifies fiscal constraints, reinforcing the need to design adaptation projects with continuity and financial viability in mind from the outset.

Overall, this dissertation contributes to the European policy and research debate on climate adaptation finance by clarifying why well-recognised adaptation challenges persist despite growing policy attention and funding. The results indicate that continuity and bankability are achievable when deliberate design choices are made, including early

integration of financial logic, systematic monitoring and verification, strengthened institutional capacity, and credible risk-sharing mechanisms. Emerging EU approaches centred on bankable-by-design and continuity-by-design, as reflected in projects such as RISE-IN, CLIMINVEST, and CLIMATEFIT, signal a shift from problem diagnosis toward solution-oriented experimentation. Their effectiveness, however, ultimately depends on sustained public-sector capacity, policy coherence, and alignment between adaptation objectives and the operational realities of finance. Advancing climate adaptation in Europe therefore requires not only increased resources, but a structural rethinking of how adaptation projects are conceived, financed, and anchored over time.

Building on the findings of this dissertation, several pathways open for further research and policy development aimed at strengthening both the analytical foundations and the practical implementation of adaptation finance frameworks.

A first avenue for future work relates to the systematic integration of qualitative and quantitative approaches. While in-depth interviews provide valuable insights into governance dynamics, financial decision-making, and institutional constraints, complementary quantitative analyses could enhance understanding of post-project trajectories across a wider portfolio of adaptation initiatives. This would be particularly relevant in light of ongoing efforts by the European Commission and the OECD to improve monitoring, evaluation, and learning mechanisms for climate-related public expenditure.

A second area for further exploration concerns the development and application of financial performance and impact metrics for climate adaptation. As emphasised in international policy discussions led by the OECD, the United Nations, and the IPCC, adaptation outcomes are often characterised by long time horizons, indirect benefits, and systemic risk reduction, which remain difficult to capture within conventional financial frameworks. Future research could therefore contribute by testing and refining indicators that link adaptation outcomes, such as avoided losses or enhanced resilience, to financial assessment tools that are meaningful for both public authorities and private investors.

Third, comparative research across governance and policy contexts could provide additional insights into how institutional arrangements influence adaptation finance pathways. While this study focuses on the European Union framework, shaped by instruments such as the European Green Deal, Horizon Europe, and the European Climate Law, further analysis of national and international approaches could help identify transferable practices and contextual factors that support project continuity and investment mobilisation. Such comparative perspectives are increasingly encouraged within international climate governance frameworks.

A fourth direction for future work involves adopting longer-term analytical perspec-

tives. As highlighted by both interviewees and international organisations, the benefits of climate adaptation often materialise beyond the timeframe of standard project cycles. Longitudinal studies following adaptation initiatives after the end of public funding could support a deeper understanding of how governance structures, financing arrangements, and maintenance strategies evolve over time, and how early design choices influence long-term outcomes.

A further area for continued research and policy development concerns the balance between problem diagnosis and solution implementation in the climate adaptation finance agenda. At both international and European levels, substantial progress has been made in identifying climate risks, assessing vulnerabilities, and quantifying adaptation gaps, as reflected in recurring assessments by the IPCC, the European Environment Agency, and the United Nations. While this diagnostic focus has been essential for raising awareness and informing strategic priorities, future efforts could place greater emphasis on translating these insights into operational, scalable financing solutions. In particular, there remains scope to move beyond problem definition toward the systematic testing, evaluation, and replication of concrete financial and institutional mechanisms that enable adaptation projects to transition from publicly funded interventions to durable, investment-ready solutions. Strengthening this solution-oriented dimension, through pilots, comparative evaluation, and iterative learning, would support policy makers and financial actors in closing the gap between recognised adaptation needs and effective implementation pathways.

Finally, future research could examine specific financial instruments and risk-sharing mechanisms in greater detail, building on the growing body of blended finance case studies documented by the OECD and multilateral institutions. Analysing how public guarantees, outcome-based financing, or portfolio approaches perform in different adaptation contexts would support evidence-based policy design and contribute to the gradual normalisation of adaptation within sustainable finance frameworks.

By bringing together institutional, financial, and governance perspectives, it shows that the core challenge lies not in the absence of solutions, but in the persistent misalignment between adaptation objectives and prevailing financial and project-design logics. Addressing this gap requires moving beyond episodic funding and toward continuity-by-design approaches that embed financial viability, monitoring, and institutional anchoring from the outset. In this sense, the findings point not only to what constrains adaptation today, but to how Europe can begin to translate adaptation ambition into durable, scalable, and investable resilience pathways.

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Annex A Project Profile: CLIMATE-FIT (Resilient CLIMATE Financing and Investment Taskforces)

Project Title: CLIMATE-FIT

Programme: Horizon Europe – Mission on Adaptation to Climate Change

Call: HORIZON-MISS-2022-CLIMA-01-06 – Testing and demonstrating transformative solutions to climate resilience in highly vulnerable regions and local communities

Project Duration: 1 Sept 2023 – 31 Dec 2026

Total Cost : € 5,760,510.00 **EU Contribution :** € 5,760,510.00

Coordinating Institution: Fonden World Climate Foundation

Project Objective: CLIMATEFIT is designed to tackle a core challenge in climate adaptation: the persistent gap between local-level climate ambitions and the financial innovation required to deliver them. CLIMATEFIT addresses the gap between climate adaptation planning and bankable investment by strengthening financial literacy, investment readiness, and collaboration between public and private actors. The project supports public and private actors in structuring and financing climate adaptation initiatives through targeted tools, capacity building, and stakeholder engagement. It adopts a practice-based approach that integrates financial considerations into early project design, supports viable business models, and facilitates connections with public and private financiers. CLIMATEFIT builds capacity in adaptation finance, develops locally adapted financial blueprints, and tests them through real-world demonstrations, including in the Porto Metropolitan Area. The project also creates a European platform to connect adaptation projects with investors, supporting scalability and long-term sustainability.

Methodology: CLIMATEFIT adopts a multi-dimensional methodological approach that begins by identifying key institutional and financial barriers to climate adaptation at the regional level. It then co-develops targeted training and financial structuring tools to strengthen the capacity of public authorities and project promoters. These solutions are tested in selected regions through Living Labs, where stakeholders work on real adaptation challenges and co-design implementable strategies. Insights from these regional pilots are consolidated into a pan-European platform, positioning CLIMATEFIT as both a capacity-building and system-level innovation initiative aimed at supporting financially viable and investable adaptation solutions.

Website: <https://climatefit-heu.eu>

Cordis Profile: <https://cordis.europa.eu/project/id/101112705>

Annex B Project Profile: RISE-IN (Resilient Investment for Sustainable Environments)

Project Title: RISE-IN – Resilient Investment for Sustainable Environments

Programme: Horizon Europe – Mission on Adaptation to Climate Change

Call: HORIZON-MISS-2024-CLIMA-01-06 – Testing and demonstrating transformative solutions to climate resilience in highly vulnerable regions and local communities

Project Duration: 1 May 2025 – 30 April 2030

Total cost : € 9,502,652.00 **EU contribution :** € 8,944,439.75

Coordinating Institution: Politecnico di Milano (POLIMI)

Main Contact Persons: Prof. Laura Grassi – Associate Professor, School of Management, POLIMI ; Carla Gonçalves - Executive Director of Centro do Clima

Project Objective: RISE-IN addresses a central challenge in climate adaptation: transforming climate-resilient concepts into projects that can attract funding and be implemented at scale. Although many European regions are developing adaptation strategies, these often remain at the planning stage due to limited financial resources, weak investor interest, and the absence of proven, sustainable financing models. To respond to this gap, RISE-IN introduces the Bankability Readiness Level (BRL), a framework designed to assess how prepared climate adaptation solutions are to secure investment from both public and private sources. The BRL helps cities and regions evaluate financial viability, identify suitable investor profiles, and determine what adjustments are needed to improve investability. The project applies this framework to Climate Resilient Solutions (CRS), including nature-based, technological, and infrastructure interventions co-developed with local stakeholders in demonstrator regions. By jointly assessing resilience outcomes and financial potential, RISE-IN aims to support the design of adaptation projects that are effective, investable, and capable of long-term continuity.

Methodology: RISE-IN co-develops and tests tailored CRS and financial models across demonstrator cities, engaging local stakeholders and private-sector actors. Each solution is assessed using the BRL framework to ensure that it meets criteria for scalability, financial sustainability, and alignment with EU climate finance objectives. The project emphasizes participatory design, systems thinking, and long-term institutional anchoring.

Website: <https://www.rise-in.eu>

Cordis Profile: <https://cordis.europa.eu/project/id/101214441>

Annex C Project Profile: CLIMINVEST (Bankable by Design, Continuous, and Predictive Climate Adaptation Investments with Co-Benefits)

Project Title: CLIMINVEST

Programme: Horizon Europe – Mission on Adaptation to Climate Change

Call: HORIZON-MISS-2024-CLIMA-01-06 – Demonstration of approaches to improve bankability of solutions by design, addressing the co-benefits (mitigation and adaptation) to improve revenue streams.

Project Duration: 1 May 2025 – 30 April 2028

Total Cost : € 11,810,143.25 **EU Contribution :** € 8,999,807. 76

Coordinating Institution: GFT Italia SRL, Italy

Main Contact Person: John Soldatos, Internet of Things and Artificial Intelligence Expert

Project Objective: The CLIMINVEST project addresses a central challenge in climate adaptation: ensuring that adaptation initiatives are not only technically effective but also financially viable and attractive to investors. Many projects struggle to move beyond planning due to weak revenue models, limited alignment with investor expectations, and low scalability. CLIMINVEST responds by developing a Bankable-by-Design (BbD) methodology that integrates investment logic into adaptation project design from the outset. The project provides tools to support return on investment, incorporate financial and ESG considerations, and facilitate market uptake, while also establishing a marketplace of bankable adaptation solutions to promote replication and private investment engagement.

Methodology: CLIMINVEST adopts a multi-layered methodological approach that focuses on embedding investment logic into climate adaptation from the outset. The project defines and tests the Bankable-by-Design framework through engagement with public authorities and private financiers, developing project blueprints that integrate technical, financial, and ESG dimensions. These are validated through real-world demonstration projects, where financial viability and scalability are continuously assessed. A key output is a digital marketplace that catalogues validated adaptation solutions, supports investor matching, and enables performance monitoring. Through ecosystem-building activities, CLIMINVEST promotes collaboration between project developers, financial institutions, and policy actors, supporting replication and long-term investment alignment.

Website: <https://climinvest.horizon.eu>

CORDIS Profile: <https://cordis.europa.eu/project/id/101212947>

Annex D

TABLE I: Key interview dimensions, type, specific topics explored, and analytical purpose.

Interview Dimension	Type	Specific Topics Explored	Purpose in the Study	Reference
Financing mechanisms & investment conditions	Objective	Grant structures, blended finance instruments, public-private funding flows, post-funding financial pathways	Understand how adaptation projects are currently financed and where structural gaps emerge once public funding ends	Moser & Ekstrom (2010); OECD (2025)
Policy design & regulatory context	Objective	EU Taxonomy, CSRD, Horizon Europe mission design, national adaptation plans, regulatory incentives and gaps	Assess the extent to which existing policy frameworks create enabling or constraining conditions for private finance mobilisation	Kaur et al. (2023); Directorate-General for Climate Action (2025)
Bankability & investment readiness	Objective	Revenue models, risk-return profiles, co-benefits, monetisation of adaptation outcomes, financial structuring	Examine what makes adaptation projects attractive — or unattractive — to private investors, and what design features improve investability	Wullweber et al. (2025); Climate Policy Initiative (2024)
Perceptions of risk & value attribution	Subjective	How stakeholders define and assess financial, reputational, and systemic risk in adaptation; how value is assigned to non-market outcomes	Capture divergences between public and private sector risk logics and the role of perception in limiting or enabling investment	Moser et al. (2019); Bisaga & To (2021)

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Interview Dimension	Type	Specific Topics Explored	Purpose in the Study	Reference
Institutional readiness & governance capacity	Subjective	Administrative capacity, financial literacy, cross-sectoral coordination, local authority capability, knowledge retention after project closure	Explore how institutional factors at local, national, and EU levels constrain or support the transition from publicly funded pilots to durable solutions	Moser & Ekstrom (2010); Moser et al. (2019)
Public-private alignment & engagement models	Objective/ Subjective	Timing and structure of private sector engagement, co-design processes, PPP models, blended finance governance	Assess whether and how public and private actors can be aligned from the outset of project design to support long-term continuity	OECD (2025); Wullweber et al. (2025)
Geopolitical & fiscal context	Objective/ Subjective	Shifting public budget priorities, defence spending pressures, political commitment to climate action, policy stability	Situate the adaptation finance challenge within the broader fiscal and political environment shaping investment decisions in 2025–2026	Directorate-General for Climate Action (2025); UNEP (2024)

Annex E

TABLE II: Interview Overview

Name	Role	Date of Interview	Key Points
Kostas Metaxas	Advisory and Asset Manager; Co-Founder and CEO at KM cube	16 December 2025	• Investor demand for ESG and adaptation is very limited. • Sustainability constraints reduce expected returns. • Clear ownership and risk-sharing are required. • Guarantees are needed to align public and private horizons.
Jonh Soldatos	Internet of Things and Artificial Intelligence Expert	17 December 2025	• Adaptation investment depends on measurable risk–return performance. • Bankability must be embedded from project design. • ESG benefits alone do not attract investors.
Laura Grassi	Coordinator Project RISE-IN	18 December 2025	• Existing financial and regulatory frameworks are incompatible with nature-based adaptation projects. • Adaptation projects are long-term and difficult to monetise within current investment models. • Public funding alone is insufficient; private capital requires clearer risk–return logic.

Continued on next page

Name	Role	Date of Interview	Key Points
—	Expert actively involved in the design and implementation of climate adaptation projects	5 January 2026	• Local authorities lack capacity to engage financial actors early. • Late investor involvement undermines project bankability. • Adaptation finance is constrained by public resource scarcity. • Adaptation is viewed mainly as a reputational activity by financiers.
—	Senior Expert on Public Funding Agencies	8 January 2026	• Horizon Europe promotes collaboration but not continuity. • ERC prioritises scientific impact over scalability. • Fragmented funding systems hinder post-project pathways. • Continuity should not be assumed for all projects.
Carla Gonçalves	Executive Director, Centro do Clima (RISE-IN partner)	9 January 2026	• Project knowledge is often lost because technical teams are hired only for the project duration. • Private investment is limited mainly by unclear or insufficient financial returns. • Social, ecological, and recreational co-benefits are critical to strengthening project attractiveness. • Lack of baseline data and post-project monitoring hinders value demonstration.

Continued on next page

Name	Role	Date of Interview	Key Points
—	Senior expert in climate finance and regulation	16 January 2026	• Regulation alone cannot unlock adaptation finance. • Adaptation lacks a clear business case. • Benefits are difficult to translate into financial value. • Policy certainty is essential for investor engagement.
Gabriela Prata Dias	Head of Section on Business Models and Finance, UNEP Copenhagen Climate Centre	16 January 2026	• Monitoring and verification enable financial credibility. • Financial literacy gaps constrain public authorities. • Early public–private engagement supports continuity. • Data availability is critical for investment decisions.
Paul Smith	Senior Consultant, Climate Change, UNEP Finance Initiative	28 January 2026	• Adaptation is recognised as strategically important but rarely integrated into financing decisions. • Short time horizons and weak demand limit financial materiality of adaptation risks. • Data and modelling gaps constrain assessment of physical climate risks. • Limited institutional capacity restricts development of adaptation finance products.

Annex F Thematic Coding of Interview Data

Coding was conducted manually using a combination of descriptive and interpretive labels applied directly to interview transcripts. An initial set of open codes was generated inductively from a close reading of each transcript individually, without imposing predetermined categories. Codes were then compared systematically across all nine transcripts to identify convergences and divergences, and where different interviewees used distinct language to describe structurally similar constraints, these were consolidated under a single sub-theme. Overlapping codes were merged and organised into higher-order analytical themes that directly address the research questions. The resulting thematic structure informed the organisation of the Results chapter (Section 5).

Colour key: Blue Institutional & governance context Yellow Financial design & bankability Green Hybrid approaches Red Regulation & policy context

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Interviewee	Initial Code	Illustrative Content (Paraphrased)	Sub-theme	Analytical Theme
Carla Gonçalves	Temporary project staffing	Project teams are hired specifically to execute the project; when it ends, that knowledge is often lost	Institutional discontinuity	Institutional & governance constraints
Senior expert Public Funding	Fragmentation of funding ecosystems	Horizon Europe represents less than 15% of total R&I funding in the EU; the rest is fragmented across national and regional systems that are often weakly aligned	Structural fragmentation	Institutional & governance constraints
Senior expert Public Funding Agencies	Continuity not guaranteed by design	Receiving public funding does not guarantee a subsequent funding line; the system is competitive by definition	Absence of continuity pathways	Institutional & governance constraints
Senior expert Public Funding Agencies	Not all projects deserve continuity	Continuity should not be assumed as a universal objective; competitiveness must remain the governing principle	Selective continuity logic	Institutional & governance constraints
Expert on Adaptation Projects	Late engagement of financial institutions	Engagement of financial institutions tends to be ad hoc and late, preventing meaningful co-design of bankable projects	Late investor involvement	Institutional & governance constraints

Interviewee	Initial Code	Illustrative Content (Paraphrased)	Sub-theme	Analytical Theme
Expert on Adaptation Projects	Language and priority divergence between sectors	Public authorities and financial institutions use different language, start from different points, and pursue different ends	Sector misalignment	Institutional & governance constraints
Paul Smith	Disconnect between awareness and financial action	Adaptation is the number one topic for banks worldwide strategically, yet this has not translated into actual financing activity	Awareness-action gap	Institutional & governance constraints
Paul Smith	Short lending horizons	Banks do not see climate risks as material within current loan timeframes; risks may materialise in 20 years but not within loan cycles	Temporal mismatch	Financial design & bankability challenges
Laura Grassi	NbS do not generate cash flows	NbS cannot generate cash flows now or in the future; conventional PPP models cannot simply be applied to this context	Revenue model absence	Financial design & bankability challenges
Kostas Metaxas	Low investor demand for ESG products	Out of 100 clients, only one is interested in ESG-compliant portfolios; sustainability is not a driver for mainstream investors	ESG drag	Financial design & bankability challenges
Kostas Metaxas	Unclear return profile	Investors are wired to expect bonds or dividends; sustainability projects have indirect revenues that are not clear	Opaque revenue logic	Financial design & bankability challenges
Expert on Adaptation Projects	Most adaptation benefits are public goods	Even when private actors implement adaptation, positive externalities benefit society broadly, making revenue generation structurally difficult	Public good problem	Financial design & bankability challenges

Interviewee	Initial Code	Illustrative Content (Paraphrased)	Sub-theme	Analytical Theme
Senior expert in climate finance and regulation	Business case is the primary barrier, not regulation	If there is no business case for the activity that needs to be financed, no amount of regulation will solve that situation	Business case absence	Financial design & bankability challenges
Gabriela Prata Dias	Financial literacy gaps in public authorities	It is often easier to get a loan to renovate a kitchen than to restore a forest area; capacity gaps remain across public institutions	Financial literacy deficit	Financial design & bankability challenges
Gabriela Prata Dias	Adaptation returns are indirect and deferred	In mitigation there are clear return mechanisms; in adaptation, returns come mainly as avoided costs or indirect health improvements	Deferred indirect returns	Financial design & bankability challenges
Gabriela Prata Dias	Monitoring and verification as enabling mechanism	Monitoring tools allow projects to return to the beginning and identify where things could have been improved across investment cycles	Monitoring & verification	Hybrid approaches & enabling mechanisms
Gabriela Prata Dias	Early public-private engagement	Bringing public and private actors together from the beginning helps maintain interest and support long-term maintenance	Early co-investment design	Hybrid approaches & enabling mechanisms
Kostas Metaxas	Need for soft government guarantees	Private investors need some sort of soft guarantee that the government will step in; subsidies or first-loss arrangements give confidence	Public risk-sharing mechanisms	Hybrid approaches & enabling mechanisms
Paul Smith	First loss capital is hard to find	Even development finance institutions often do not have access to large volumes of concessional first-loss capital	First loss capital shortage	Hybrid approaches & enabling mechanisms

Interviewee	Initial Code	Illustrative Content (Paraphrased)	Sub-theme	Analytical Theme
John Soldatos	Co-benefits as an additional financial line	One infrastructure delivering multiple benefits adds one more line to the bottom line, generating growing interest from financial actors	Co-benefit monetisation	Hybrid approaches & enabling mechanisms
Expert on Adaptation Projects	Coupling adaptation with revenue-generating activities	Public authorities need to embed adaptation measures within broader projects that deliver sustained and reliable revenue streams	Revenue coupling strategy	Hybrid approaches & enabling mechanisms
Senior expert in climate finance and regulation	Regulation alone cannot drive adaptation finance	Adaptation is about adjusting to unchecked externalities, not correcting them; return generation is structurally more complex than in mitigation	Regulation-business case gap	Regulation, policy context & fiscal pressure
Expert on Adaptation Projects	Geopolitical pressures undermining adaptation finance	Defence spending and national security priorities are diverting public resources; investors are shifting attention from sustainability to security	Geopolitical fiscal pressure	Regulation, policy context & fiscal pressure
Gabriela Prata Dias	Policy stability as critical enabling condition	Banks and investors consistently identify policy stability as fundamental; a good project can fail if there is doubt about the policy framework	Policy predictability	Regulation, policy context & fiscal pressure
Paul Smith	Resilience framing as political alternative	In the current political climate, talking about resilience rather than climate change can gain traction even with sceptical governments	Reframing for political traction	Regulation, policy context & fiscal pressure
Carla Gonçalves	Lack of baseline and post-project data	Many EU projects lack evaluation of conditions before, during, or after implementation; without this data it is difficult to attract investors	Data availability gaps	Regulation, policy context & fiscal pressure

Annex G Script Questions - Expert in climate finance and regulation

1. From your perspective [...], how do you see climate adaptation currently positioned within the European sustainable finance agenda? Based on your work with banks, is adaptation primarily perceived as a regulatory obligation, a physical risk management issue, or an emerging strategic priority?

2. In your experience, how have recent European regulatory developments (such as the EU Taxonomy, CSRD, and climate-related supervisory expectations) influenced how banks think about and approach climate adaptation? Do you see these frameworks as genuinely shaping behaviour, or more as compliance-driven exercises at this stage?

3. [...], what regulatory or supervisory uncertainties most limit deeper engagement with adaptation? For instance, are banks more constrained by unclear definitions, lack of metrics, disclosure expectations, or prudential considerations?

4. Based on what you observe in practice, to what extent do banks still frame climate adaptation mainly as a risk management issue rather than as a strategic area of action? How does this framing affect the level of attention, resources, and integration adaptation receives internally?

[...]

6. One challenge often mentioned is the lack of robust and comparable metrics for adaptation outcomes. In your experience, how does this gap affect banks' ability to integrate adaptation into decision-making, particularly in relation to regulation, disclosure, and internal risk processes?

7. Based on your work with banks across Europe, how important is long-term public policy clarity for meaningful engagement with adaptation? Does uncertainty around public adaptation priorities or funding reduce banks' willingness to move beyond minimal compliance?

8. Looking ahead, from your personal perspective, what changes at the European policy or regulatory level would most help normalise climate adaptation as a core concern within the banking sector? What would make adaptation "stick" institutionally rather than remain a secondary issue?

9. In the current geopolitical context, marked by rising security concerns and increased defence spending across Europe, how do you see these shifting public priorities affecting the role of banks in climate adaptation? Do you expect this context to weaken engagement with adaptation, or could it increase pressure to integrate climate resilience more systematically into financial risk management?

Annex H Script Questions - Interview Gabriela Prata Dias

1. Based on your experience with energy efficiency policies and business models, which structural or financial design factors most often limit the continuity of publicly funded climate projects once initial funding ends? Even when projects are technically sound, where do you most commonly observe breakdowns in continuity?
2. In your experience, which types of design approaches or principles have helped bridge public objectives with financial viability in the energy sector or other climate policies? Do you believe there are general lessons that could be transferred to climate adaptation projects?
3. From a financing and business-model perspective, to what extent do current public funding programmes effectively prepare projects for post-funding scalability or private-sector engagement? Do you observe a disconnect between how projects are designed under public programmes and the typical requirements of financial institutions?
4. Many climate projects, particularly adaptation projects and nature-based solutions, generate collective, long-term benefits or risk reduction rather than direct revenues. Based on your experience, how difficult is it to make these benefits intelligible and credible to financial actors?
5. Under what institutional or market conditions do you believe climate projects become more “bankable”? For example, how do factors such as regulatory stability, clarity of value flows, risk-sharing mechanisms, or policy predictability weigh relative to one another?
6. Hybrid approaches such as blended finance, public guarantees, or de-risking instruments are often cited as solutions for projects with weak or non-existent market revenues. From your experience, what determines whether these instruments successfully mobilise private finance or remain limited to isolated pilot experiences?
7. Based on your work with cities and capacity-building initiatives, do you consider institutional capacity to be a limiting factor for project bankability? In particular, how do technical skills, access to data, or experience in financial structuring influence the ability of public actors to engage with investors?
8. Considering current pressures on public budgets and shifting political priorities, how do you personally assess the future of public–private collaboration in climate projects in Europe? Does this context reinforce the need for new business models and financial structures, or does it risk marginalising projects that do not fit traditional investment logics?

Annex I Script Questions - Interview Paul Smith

1. From your perspective and experience in the UNEP FI, how has the climate adaptation finance landscape evolved in recent years? In particular, are you observing changes in how adaptation is framed within European sustainable finance agendas, regulatory discussions, and financial institutions' risk management strategies?

2. Despite increased policy attention to adaptation, many publicly funded adaptation projects struggle to attract follow-on finance once initial funding ends. From your perspective, what are the most significant structural barriers preventing adaptation projects in Europe from becoming financeable and scalable?

3. Are these barriers primarily related to project governance and delivery capacity, financial structuring and revenue models, regulatory and prudential constraints, or the lack of credible metrics to assess adaptation outcomes and risk reduction? Which of these dimensions tends to be the most constraining for European financial institutions in practice?

4. Based on UNEP FI's engagement with European banks, insurers, and investors, from your experience, are there specific project structures or governance arrangements that increase confidence in financing adaptation? For example, do public guarantees, long-term operating entities, aggregation mechanisms, or programmatic approaches improve perceived investability? 5. Are there existing financial instruments or market mechanisms in Europe, originally developed for infrastructure, energy, or municipal finance, that could realistically be adapted to support adaptation finance at scale? What currently limits their broader application to adaptation projects?

6. A recurring challenge in adaptation finance is translating resilience and risk reduction into financial value that can be priced and monitored. How do you think the UNEP FI is approaching this challenge in its European work, and where do current metrics, disclosure frameworks, or supervisory expectations still fall short?

7. To what extent do you observe a mismatch between how adaptation value is generated (e.g. avoided losses, increased systemic resilience) and how European financial markets assess risk, return, and capital allocation? What changes in reporting standards, data availability, or regulatory guidance would help reduce this gap?

8. Focusing specifically on nature-based solutions, under what institutional, regulatory, or market conditions do you believe NbS could become more financeable or "bankable" in Europe? Are the main obstacles related to policy certainty, data and verification, aggregation, or perceived performance and longevity risks?

9. What role do hybrid approaches, such as blended finance, public guarantees, first-loss structures, or other de-risking instruments, currently may play in unlocking adaptation finance in Europe? From your perspective, are these approaches underdeveloped, under-utilised, or constrained by regulatory or market barriers?

10. Looking ahead, what changes in European policy frameworks, sustainable finance regulation, or financial institutions' mandates would be most critical to enable adaptation to transition from primarily publicly funded interventions to durable, scalable, and investable pipelines?

11. In the current geopolitical context, characterised by increased defense spending and tighter public budgets across Europe, how do you see these shifts affecting adaptation finance? More specifically, could reduced public investment undermine private sector confidence in adaptation projects, or does it increase the need for stronger risk-sharing and blended finance mechanisms?