The economics of nature-based solutions.

Markets, financing and incentives for NbS

WP3, Task 3.3

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ABBREVIATIONS AND ACRONYMS

ACRONYM	DESCRIPTION
EU	European Union
EC	European Commission
I4N	Invest4Nature
NbS	Nature-based Solution
NbE	Nature-based Enterprise
UNEP	United Nations Environment Programme
ILO	International Labour Organisation
IUCN	International Union for Conservation of Nature
GCF	Green Climate Fund
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analyses
SME	Small and Medium-sized Enterprises
PES	Payments for Ecosystem Services
R&D	Research and Development
CNEP	Connecting Nature Enterprise Platform
ECB	European Central Bank
SAFE	Survey on the Access to Finance of Enterprises
OECD	Organization for Economic Cooperation and Development
FTE	Full Time Equivalents
TNFD	Taskforce on Nature-related Financial Disclosures
SBTN	Science Based Targets Network
CSRD	Corporate Sustainability Reporting Directive
BNG	Biodiversity Net Gain
SUDs	Sustainable Drainage
FFF	Family, 'Fools' and Friends
CBA	Cost-Benefit Analysis
LCA	Life-Cycle Assessment
EIBs	Environmental Impact Bonds
PPP	Public-Private Partnership
CBD	Convention on Biological Diversity
USAID	U.S. Agency for International Development
IFC	International Finance Corporation
ESG	Environment, Social and Governance

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EXECUTIVE SUMMARY

The Invest4Nature (I4N) project recognizes the crucial role of Nature-based Solutions (NbS) in addressing societal challenges and securing a healthier and more sustainable future. While the potential of NbS is undeniable, unlocking their full potential depends on the development of robust markets and effective financing mechanisms. Currently, there is a range of NbS emerging, primarily supported by strong public funding, but a comprehensive market for NbS has not yet emerged, indicating a need for further exploration of how to attract private investment alongside continued public support.

By examining the perspectives and needs of key stakeholders - public sector entities, investors, and Nature-based Enterprises (NbEs) - the report provides a comprehensive overview of the financing landscape for NbS and the potential for enhancing private sector involvement. The report identifies key barriers and drivers influencing NbS investments and offers recommendations to enhance the effectiveness and scalability of NbS projects. It emphasizes the importance of a diversified financing approach, combining public and private sources, to unlock the full potential of NbS and achieve global climate, biodiversity and restoration targets.

The report identifies a significant opportunity for private sector investment in NbS, particularly through blended finance mechanisms. However, at the moment the market is still dominated by public funding, highlighting the need for a supportive environment to attract private capital and ensure the financial viability of NbS projects. The investor community is interested in NbS projects, particularly those focused on agriculture/food, water, forestry, and urban environments, but several barriers hinder investments in this area, including challenges in accessing information, lack of clear revenue sources, knowledge gaps, high transaction costs, and limited valuation methodologies.

The report also highlights the growing market demand for NbS, driven by regulatory changes and increased awareness of climate issues. This demand presents significant opportunities for business growth and economic development, particularly for Nature-based Enterprises. However, NbEs often face challenges in accessing traditional financing options and require tailored support to scale their operations and maximize their impact.

To address the challenges in NbS financing, the report recommends a multi-level approach. At local level, it suggests raising awareness among banks, streamlining funding processes, integrating NbS into spatial planning, supporting long-term maintenance, and providing capacity building for NbEs.

Nationally, recommendations include strong commitments to nature-related goals, clear policy frameworks, tax incentives for NbS investments, enhanced cross-sectoral coordination, prioritizing applied research funding, promoting public-private partnerships, recognizing NbEs, and considering sovereign green bond issuance.

At the EU level, the report recommends increasing direct support for local implementation, integrating NbS into Sustainable Finance policy, developing standardized monitoring and reporting, fostering knowledge exchange, and mainstreaming NbS policies into broader frameworks.

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1. INTRODUCTION

The 2023 State of Finance for Nature report of the United Nations Environment Programme (UNEP) shows an increase in NbS finance of 11% since the 2022 report with the majority of funding (US$165 billion) coming from the public sector and US$35 billion coming from the private sector (United Nations Environment Programme, 2023). The report identifies the significant investment potential of NbS and reiterates calls for a tripling of investment by 2030 and a quadrupling of investment by 2050 in order for governments to meet the climate, biodiversity and restoration targets that they have agreed to. The UNEP report highlights the need for urgent efforts to divert financing away from nature-negative economic activities towards increased financing of nature-positive economic activities and highlights the potential of tools such as the EU's Sustainable Finance Taxonomy to achieve this objective.

In Europe, the concept of NbS has already become mainstreamed in policy with the European Commission (EC) leveraging hundreds of millions of Euros in demonstrating and scaling up NbS implementation since 2016 (El Harrak and Lemaitre, 2023). An extensive review of over 1,300 NbS projects in the European Union (EU) showed that public funding is the dominant source, with only 3% of projects receiving more than half of their funding from private sources (European Investment Bank, 2023). This underlines the critical need for strategies that can mobilize private sector investment to complement public funding and support the scaling of NbS. The European Investment Bank (EIB) report on Investing in NbS shows the highest potential for private investment and scaling of NbS in the urban, forestry and agriculture sector with medium potential in wetlands, rivers and lakes. Marine and coastal NbS were perceived to be of the lowest potential interest for private investors (European Investment Bank., 2023). In contrast, an EC impact assessment estimates that "conserving marine stocks could increase annual profits of the seafood industry by more than EUR 49 billion, while protecting coastal wetlands could save the insurance industry around EUR 50 billion annually through reducing flood damage losses" (European Commission, 2022).

The future of NbS financing is likely to be characterized by a greater diversity of funding sources and a more integrated approach to financing. Blended finance and innovative financing mechanisms are expected to play an increasingly important role in mobilizing private capital for NbS. The Green Climate Fund (GCF), with 45% of its portfolio contributing to NbS, has demonstrated the potential of combining climate and biodiversity financing approaches. In a recent working paper on blended finance for nature-based solutions (Green Climate Fund, 2023), the authors highlight the importance of a supportive policy environment for attracting private investment. This includes measures such as tax incentives to reduce the financial burden on investors, risk mitigation instruments to address the uncertainties associated with NbS projects, and clear standards for NbS to ensure quality and credibility. Additionally, blended finance structures should be tailored to the specific needs of each project, considering factors such as the type of NbS, the scale of investment, and the risk profile.

Despite the growing prominence of NbS in scientific and policy discussions, information and evidence pertaining to successful financing and incentive mechanisms remain fragmented and not readily accessible. This lack of data makes it difficult to quantify the true needs and potential market scale of NbS. The aim of this deliverable is to map the current state of the market for financing NbS and to explore the potential for increasing private sector engagement. This includes examining the needs and perspectives of different market players, including the public sector, investors and Nature-based Enterprises.

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1.1. CONTRIBUTIONS OF PARTNERS

Table 1 depicts the main contributions from project partners in the development of this deliverable.

PARTNER SHORT NAME	CONTRIBUTIONS
JR	Leading and contributing to the literature review; conducting public sector interviews; writing of Sections 1, 2, 3, 4, 7.
HNUA	Conducting NbEs survey and interviews; contributing to the literature review; writing of Sections 1, 2, 6, 7.
MA	Conducting investor diagnostic survey; writing of Sections 2, 5, 7.
NIVA	Contributing to the literature review; conducting public sector interviews; writing section 2.2 on the methodology of the literature review and 4.2 on Financing instruments and incentives in public sector projects.
CMCC	Contributing to the literature review.
CA	Contributing to the literature review.

Table 1. Contributions of Partners

1.2. OVERALL APPROACH

This deliverable builds on the comprehensive work done in Task 3.3, focusing on the stock-taking of markets, financing, and incentives for NbS. It is led by JR with significant inputs from research partners HNUA, NIVA, MA and contributions from CMCC and CA. The report also builds upon the comprehensive framework established in Deliverable 2.1, which provides a classification of the NbS terminology and categorizes NbS actions into types and thematic areas.

Deliverable 2.1 outlines three main types of generic NbS actions, inspired by the typology proposed by Eggermont et al. (2015) based on the level of ecosystem interventions: i) protection/conservation of high-quality or critical ecosystems and/or sustainable management of healthy ecosystems, ii) modification of existing ecosystems e.g., restoration/rehabilitation of degraded ecosystems, and iii) creation/establishment of new ecosystems. These are further classified into six thematic areas or landscapes (coastal, mountain, agriculture, forest, water management, urban) with specific NbS actions for each.

Within T3.3, a literature review was performed to map the state-of-the art for NbS financing models and incentives. This review aimed to provide a better understanding of which financing instruments are best suited for different types of NbS, thereby facilitating future NbS financing designs. To enrich the analysis and provide a comprehensive picture of financing challenges and needs, the literature review has been complemented by stakeholder perspectives (public sector, investors, Nature-based Enterprises) through surveys and interviews. Therefore, the report not only captures the landscape of NbS financing from the literature but also integrates practical insights from key stakeholders involved in the implementation and financing of NbS projects.

To understand the demand side of the NbS market, the report delves into the perspectives of both, public and private sector investors. Public sector interviews aimed at understanding the benefits and barriers public institutions face when investing in NbS and the role of governance in motivating investment. The interview partners were selected through detailed desktop research as well as provided by existing networks of I4N project partners. These included

urban planners, consultants or facilitators of NbS, and public research institutions that deal with NbS topics in cooperation with cities. In addition, companies that can form the bridge between public institutions and research organizations were interviewed.

The survey targeting the investor community aimed at eliciting responses from a broad range of potential finance providers for NbS, exploring their current or future interest or engagement with NbS, readiness (or lack thereof) to supply capital to NbS projects, and possible approaches for addressing existing barriers. This survey also aimed to identify the required and most suitable support mechanisms for private sector capital providers (banks and investment funds) to help overcome existing barriers. The survey‘s goals included improving the understanding of opportunities and barriers in accelerating private sector investment in NbS, exploring definitions of NbS “bankability“ and “investability“, inquiring about the use of cost-benefit analysis (CBA) and life cycle assessment (LCA) methods for evaluating NbS investments, and testing the interest in I4N toolbox solutions by investors/lenders.

To gain a holistic view, this research also considers the supply side by including the insights from a survey targeting Nature-Based Enterprises (NbEs). The survey aimed at better understanding NbEs knowledge of financing and scaling models as well as their needs relating to financing. A Nature-based Enterprise is defined as ‘an enterprise, engaged in economic activity that uses nature sustainably as a core element of their product/service offering’. NbEs may use nature directly, ‘by growing, harnessing, harvesting or sustainably restoring natural ecosystems, and/or indirectly by contributing to the planning, delivery or stewardship of nature-based solutions’ (Kooijman et al., 2021). Given that nature and/or NbS constitute the core product/service offering of NbEs, market opportunities for NbEs are inextricably linked to market demand and financing of NbS.

The NbE survey analysis forms part of an ongoing wider package of research, including semi-structured qualitative interviews to capture rich detail on the experiences and perspectives of diverse NbEs, and a review of literature focusing on NbE markets, financing and business models. Analysis on these components of the work is ongoing and will be integrated into future work. Initial insights are used in this deliverable to help contextualise the survey data and provide case study material.

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2. METHODOLOGY

2.1. OVERVIEW OF DATA COLLECTION METHODS

This report employs a multi-method design, applying and triangulating various research methods (Morse, 2003) to draw comprehensive conclusions and identify key policy recommendations. This chapter details the specific methods used for each data source:

- Systematic literature review: a systematic search of academic databases and grey literature was conducted to identify and analyse relevant research on NbS financing models and incentives.
- Public sector interviews: semi-structured qualitative interviews were held with public sector representatives to gain an understanding of their perspectives on NbS benefits, investment barriers, and the role of governance in NbS financing.
- Investor community survey: a diagnostic online survey was carried out to explore the interest, readiness, and engagement of private capital providers in supporting NbS investments.
- NbEs Survey: an online survey was distributed to gather data on the characteristics, financing models, and challenges faced by NbEs.

2.2. DESCRIPTION OF SYSTEMATIC LITERATURE REVIEW

To map the current landscape of literature on Nature-Based Solutions financing models and incentives, we conducted a systematic review, and this section outlines its rationale, objectives, and methodology. This review explored the effectiveness of various financing models and incentives across different NbS types, scales of investment, and challenges. It followed the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) methodology (Moher et al., 2015) and employed a four-phase methodological approach.

In Stage 1, we developed a comprehensive research plan that included identifying the aim of the review and research questions and setting inclusion and exclusion criteria for articles. For the purpose of this review, the term NbS was defined as per UNEA-5, as 'actions that protect, conserve, restore, sustainably use, and manage natural or modified terrestrial, freshwater, coastal, and marine ecosystems, which effectively and adaptively addressing socio-economic and environmental challenges to ensure human well-being, ecosystem services, resilience, and biodiversity benefits are considered' (UNEA, 2022). NbS actions include protecting high-quality ecosystems, restoring and rehabilitating degraded ecosystems, and introducing new ecosystems. NbS are recognized for their role in adapting to and mitigating climate change, conserving the environment, and driving sustainable development (Zhou and Martius, 2022).

To identify research gaps and refine the focus of our review, we conducted a mapping of existing peer reviewed reviews and grey literature reviews on financing of NbS. This mapping exercise helped us gain a comprehensive understanding of the current research landscape and pinpoint areas where further exploration was needed. In addition, it was critical to define relevant financing mechanisms in stage 1 of the review method. Hence, criteria for stock taking of both market and non-market-based financing models and non-economic incentives was outlined with examples from the private and third sector, public sector, and blended financing.

Financing models for NbS can involve public and private sector investments, grants, loans, and other financial instruments, potentially generating revenue from ecosystem services. Non-

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economic incentives include environmental stewardship and social responsibility, often reinforced by government policies. Market-based models incorporate financial instruments such as bonds and loans, leveraging private sector participation and market principles to achieve objectives. Non-market-based models rely on traditional public funding, grants, or philanthropic contributions, independent of market mechanisms.

The findings of the systematic review aimed to provide a better understanding of suitable financing models and incentives, thereby facilitating improvements and development in future NbS financing. The review aimed to address the following research questions:

1. What kinds of financing models and incentives support the implementation or maintenance of NbS across different landscapes and thematic sectors? What is the scale of NbS and financing?
2. Has the financing successfully resulted in the implementation of NbS, both in the short-term and long-term?
3. What are the drivers and barriers associated with different financing models and incentives?

Eligible articles for screening included peer-reviewed journal articles, books and chapters, edited collections, and conference proceedings in multiple languages (English, Spanish, French, Mandarin, Portuguese and German). The review considered literature from the year 1998 to 2023, regardless of publication status. The content eligibility criteria included references to any type of NbS, descriptions or assessments of financing and incentive models used for NbS and assessments of NbS within the I4N project's focused landscape types, including urban, coastal, forest and forestry, mountain, agriculture, and water management.

The eligibility decision process for inclusion of the publications in the study is illustrated in Figure 1. The eligibility decision process for inclusion of the publications in the study

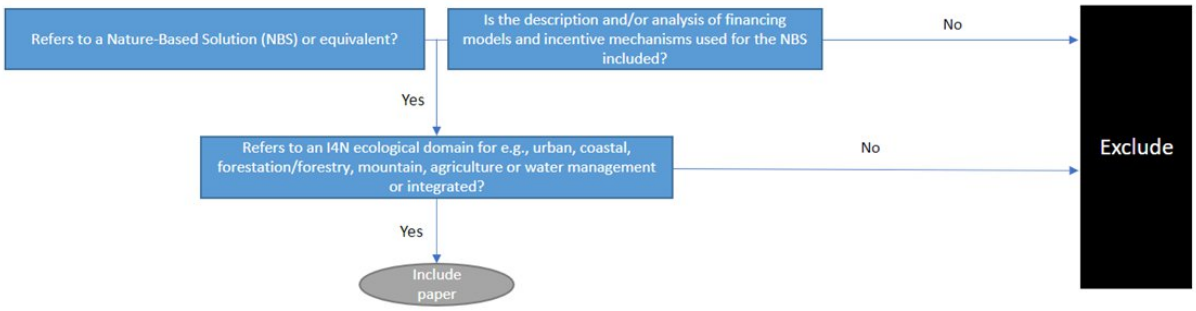

Figure 1. The eligibility decision process for inclusion of the publications in the study

Stage 2 involved conducting a systematic search using the SciVerse Scopus and ISI Web of Science databases. These were chosen for their academic scope and relevance. Based on the scope of the study and inclusion criteria, the search string was constructed as shown in Table 2. The search led to 4629 records from both databases, of which 2907 duplicates were removed. A further 20 records were imported manually from a personal archive.

Theme	Search string
Financing models and incentives	"financ*" or "carbon credits" or "carbon offsets" or "investment" or "incentives" or "grant" or "donation" or "funding" or "endowment" or "ppp" or "public-private partnerships" or "bonds" or

	"loan" or "payment for ecosystem services" or "crowd-funding" or "equity" or "insurance" or "tax" or "user fees" or "revenue" AND
Type of NbS	"nature-based solutions" or "nature-based" or "nbs" or "green infrastructure" or "blue infrastructure" or "blue-green infrastructure" or "bgi" or "natural infrastructure" or "ecosystem restoration" or "ecological engineering" or "ecological restoration" or "climate adaptation services" or "disaster risk reduction" or "eco-drr" or "protected area management" or "ecosystem services" or "climate change adaptation" AND
Ecosystems and landscapes	"urban" or "peri-urban" or "green roof" or "green wall" or "park" or "sponge city" or "garden" or "urban green space" or "river restoration" or "water management" or "agroforestry" or "wetlands" or "agriculture" or "swales" or "water" or "sea" or "coastal ecosystems" or "marine protected area" or "watershed" or "reforestation" or "afforestation" or "mountain" or "slope" or "grazing" or "revegetation" or "forests" or "riparian" or "land use conversion" or "urban planning" or "coastal" or "biodiversity" or "protection forest" or "planting"

Table 2. Search strings by themes

In stage 3, articles were screened based on the predefined inclusion criteria. This was a collaborative effort with multiple partners and reviewers, conducted through a web-based systematic review platform, HubMeta (Steel, Fariborzi and Hendijani, 2023). Each reviewer evaluated abstracts in the first screening stage and full texts in the second screening stage to ensure each article met the inclusion criteria (See Figure 2 for PRISMA diagram). The total number of records screened were 1722 and 635 (including 20 from a personal archive), in the first and second stages, respectively.

Records were excluded if they did not focus on NbS, financing or incentive models, lacked enough information on the value of financing, drivers and barriers or were not relevant to the research questions. Some papers were also tagged as 'background' as they provided contextual information for the review without being eligible for data extraction. A total of 136 records were included for data extraction. The following diagram outlines the screening process and reasons for exclusion in more detail.

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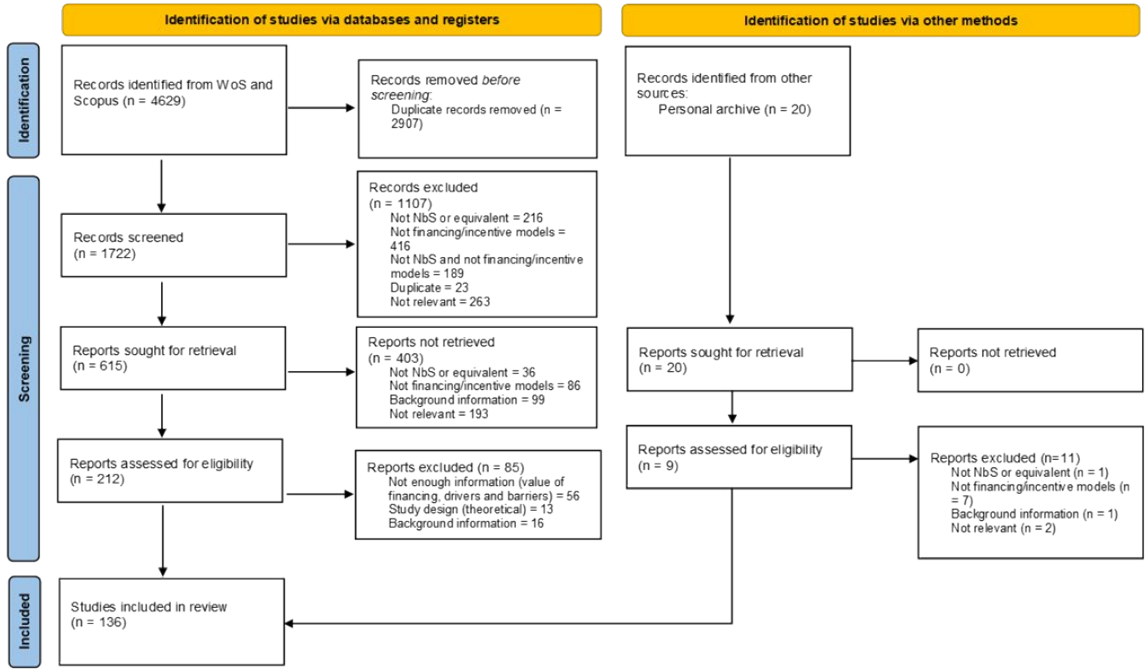

Figure 2. PRISMA Diagram of the systematic literature review

In the last stage, the 136 articles were analysed to extract relevant information, focusing on understanding how the landscape and effectiveness of investment vary with NbS type, investment scale, and the challenges addressed by NbS. Data extracted included information on key variables identified under themes such as categorization of NbS including type of NbS, actions, scale and location, financing, and incentive models such as funding sources, objectives, and level of financing and expected return on nature-based investment such as beneficiaries, success of financing, enablers, and barriers.

In the qualitative analysis phase of the literature review, MAXQDA software has been utilized to systematically code and explore the themes emerging from the extracted data. This involved first developing a coding scheme based on the research questions and potential themes. Then, codes have been assigned to segments of text that reflected specific key variables. An analysis of the co-occurrence of these codes allowed to identify patterns and relationships, and develop a deeper understanding of the key themes present within the reviewed literature.

2.3. DESCRIPTION OF PUBLIC SECTOR INTERVIEWS

To investigate the factors influencing investment in NbS across European public institutions, a qualitative study has been conducted. The research aimed to gain a realistic and up-to-date understanding of the current situation in different European countries and landscapes.

Semi-structured interviews were conducted with 17 stakeholders from 11 EU countries, representing diverse roles such as urban planners, consultants, researchers, and public institutions. The interviews covered all European regions and the six landscapes and thematic areas targeted by I4N: urban, agricultural, forestry, mountainous, coastal, and water management. The interview guideline focused on two main objectives. First, to determine which factors from existing literature are most influential in real-life decision-making regarding NbS investment. Additionally, potential solutions for overcoming these barriers were explored. Second, the research sought to understand the impact of local, regional, national, and European governance on NbS implementation, aiming to identify strategies at each level to promote further investment.

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To ensure a comprehensive understanding of the diverse contexts in which NbS are being implemented, the interviews covered a wide range of European countries (See Figure 3 below)

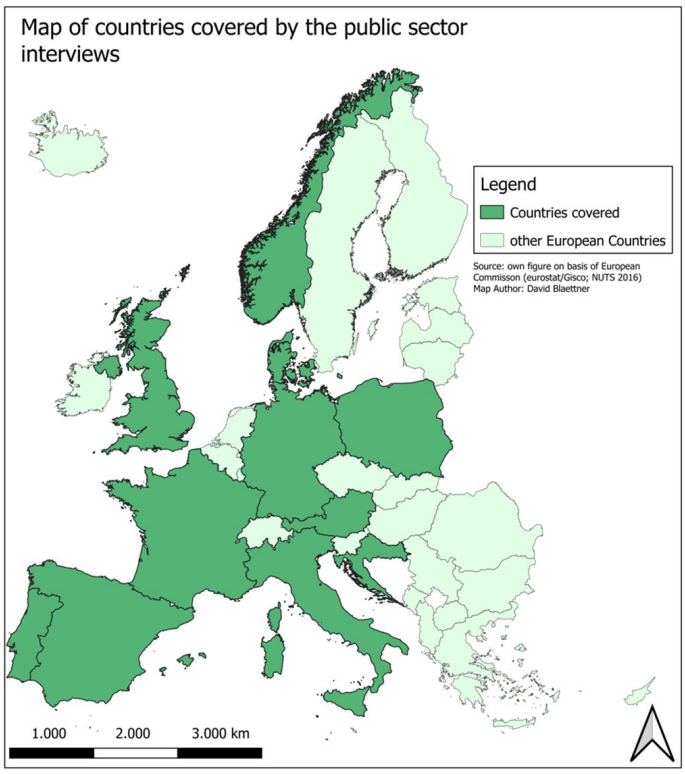

Figure 3. Map of European countries covered by qualitative interviews; Source: Own figure based on Eurostat/GISCO (NUTS)

The interview guideline was designed to foster open discussion while ensuring key topics were covered. Participants were encouraged to focus on aspects most relevant to their experiences and expertise, allowing for flexibility and individual emphasis on specific points. Each interview lasted between 30 and 60 minutes and was recorded and transcribed. Transcripts were then structured and shared with interviewees for review and supplementation. The analysis of the interview data was conducted using MAXQDA software, employing a coding system based on Kuckartz's transcription rule system (Kuckartz, 2016). The coding approach combined inductive and deductive strategies, ensuring both comprehensive coverage of relevant themes and the emergence of new insights from the data.

In addition to the main interviews, the Norwegian Living Lab, NIVA, conducted seven supplementary interviews with a specific focus on coastal and kelp forest restoration.

The analysis of the interviews revealed valuable insights into the barriers and drivers of NbS investment, as well as the role of different governance levels in shaping the implementation of NbS projects. These findings will be discussed in detail in Chapter 4.

2.4. DESCRIPTION OF INVESTOR COMMUNITY SURVEY

2.4.1. BACKGROUND

The latest UNEP State of Finance for Nature report (United Nations Environment Programme, 2023) estimates current investment in nature-based solutions to be $200 billion, of which $35 billion is provided by private finance. This is dwarfed by the private sector nature-negative

finance flows (140 times more than investment in NbS). UNEP note that the current total investment flows are only a third of what is needed to achieve climate change, biodiversity and land degradation targets by 2030 and argue for a necessary re-orientation of private finance flows away from nature-harming to nature-positive activities.

To answer the research question of how interested, ready and engaged private capital providers are to support the broader private sector investment in NbS, we are carrying out a diagnostic survey. This survey is also aimed at identifying the required and most suitable support mechanisms for private sector capital providers (banks and investment funds) to help overcome existing barriers.

Recently the European Investment Bank (European Investment Bank, 2023) published a report identifying barriers to private sector investors in nature-based-solutions. EIB surveyed and interviewed financial services representatives and other NbS professionals and distilled these key barriers to investment in NbS:

- Small individual investment size, and the scarcity and complexity of projects leading to high transaction costs;
- Higher risk profiles of the NbS projects;
- Long investment horizons;
- Relatively higher costs of NbS projects in the EU (in comparison with similar projects in the Global South);
- Regulatory hurdles and uncertainties, e.g. lack of explicit inclusion of NbS in sustainable finance taxonomies/frameworks;
- Long project development/lead times until financial returns can be generated;
- Land availability, cost and suitability;
- Lack of monitoring, reporting and verification processes leading to lack of data of existing projects, which hiders investment due diligence.

I4N aims to build upon these insights and while it is beyond the scope of the survey to explore all possible solutions for these barriers it will help to:

- Clarify the in-practice use of the terms “bankability”, “investability” for improved understanding of the similarities and differences in the understanding of the concepts among financial services participants.
- Establish which types of nature-based solution projects may have higher attractiveness to capital providers and the most suitable types of investment/lending, as seen by Financial Services entities.
- Validate some of the previous findings as regards identified barriers to investment in NbS, and elicit more detailed insights into the specific shortcomings of NbS assessment tools and methodologies.
- Take a step further by inquiring the suitability of knowledge and methodological support tools to overcome those barriers.

Survey aims

The survey was designed to elicit responses form a broad range of potential finance providers for NbS, exploring their current or future interest or engagement with NbS, readiness (or lack thereof) to supply capital to NbS projects, as well as possible approaches for addressing the existing barriers.

The aims of the survey were as follows:

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1. Improve/validate the understanding of opportunities and barriers on accelerating private sector investment in nature-based solutions by financial services entities;
2. Explore the currently used definitions of NbS "bankability"/"investability" and approaches for their measurement and verification and identify current gaps in those approaches, which limit the investment potential;
3. Inquire about the use of CBA and LCA based method use and usefulness for evaluating NbS investments/lending and any application challenges;
4. Test the interest in I4N toolbox solutions by investors/lenders.

Target audiences

For the purposes of this task, the term "investor" is interpreted to include two main types of private capital providers: investment funds (primarily financing via equity and debt instruments) and banks (primarily lending).

The target audiences of the Investor Diagnostic Survey were as follows:

- Credit institutions (banks) – more likely to use the term "bankability"
- Investment funds / asset managers and asset owners (including pension funds)"- more likely to use the term "investability"
- Insurance company investment activities

The scope of this task excludes other types of private sector investments, such as company direct investment/purchasing via their capital expenditure flows, and private sector R&D investments into NbS. It likewise limits the insurance sector to their direct investment activities rather than their underwriting actions. Insurance underwriting may have a supporting role in incentivising NbS investment, however does not represent direct capital flow.

2.4.2. METHODOLOGICAL APPROACH

Cross-sectional research design

The survey was based on cross-sectional research design. Cross-sectional research designs are aimed at collecting data on significantly more than one case (e.g. surveying a larger number of respondents) at a single point in time (e.g. most questions in a survey will be answered at approximately the same time). Cross-sectional research allows for the analysis of patterns of association – the relationships between the variables (e.g. are investments funds or banks more ready to provide capital for NbS), but not the direction of causality (e.g. whether the higher interest of banks to provide capital for NbS is because of their use of more advanced valuation methods, or the other way around). This research design also does not foresee any modification of the variables during research process.

Mixed methods, convergent parallel research approach

The survey employed mixed methods research approach, which refers to collection and analysis of qualitative and quantitative data, in a complementary manner (Bryman, 2016). In this research task, both types of data were gathered in online survey questionnaires. This can likewise be classified as convergent parallel research where both qualitative and quantitative data are gathered at the same time, and are related to each other to draw a rich picture of the themes explored (Harvard Catalyst, 2024).

Online survey method

An online survey is essentially a type of self-completion survey, where survey is understood to be a data collection method that uses questionnaires to collect data from a sample of population of interest (reference). An online survey ensures a higher quality of data due to

several automated features, such as automated branching, immediate input data validation, alerts of missing entries, and data entry phase being just one step.

A combined list-based and non-list-based non-probability survey was conducted (See Table 3 for the question types), with the original list of target respondents is sources within researchers' professional networks and combined with an open invitation on the internet.

Question types to be included in the Survey	
Introductory statements	Used to establish initial understanding of the subject matter and the relationship of the respondent to the subject.
Characterising/descriptive questions	Used to characterise and classify respondents on to types/categories for potential subsequent correlation analysis
Multiple-choice questions	Provides respondents with multiple answer options. In this survey, most will be multi select options, where the respondent can select more than one answer from the list. The advantage of multiple-choice question over open-ended free text ones is higher level of categorisation of answers, which lends itself to quantification and correlation analysis. In most cases, multiple-choice questions will be combined with open-ended free text answer options (see below).
Open ended questions	For the purposes of this survey, the open ended questions are presented with free text input fields and usually combined with a multiple-choice question. This allows for added detail and nuance to the stricter categories of multiple-choice.
Likert scale ranking questions (definite ranking)	Liker scale ranking questions in this survey are used to elicit the degree of attitudes or agreement for certain statements or concepts. This survey employs verbal ranking scales and uses definite ranking – where each concept is ranked independently from each other
Relative ranking	In some cases, a relative ranking is more suitable – where it is important to know the respondent view on the most or less important response options. Here the options are ranked in relation to each other.
Direct vs. indirect vs. implied questions	As this survey is enquiring respondents to provide answers from their organisation's perspective, which means they are not meant to elicit personal views and therefore are not considered sensitive in nature, the questions are phrased as direct questions.

Table 3. Question types included in the survey

Survey Dissemination Methods and Channels

The online survey was distributed in both targeted and open manners:

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- Direct messaging of Financial Services contacts stemming from professional network of the researchers (comprising ca. 250 contacts)
- Via I4N Channels: newsletter, website & social media
- Via I4N Project Partner channels: newsletters & social media
- LinkedIn: via organic posting in relevant 'Groups' throughout the campaign
- Via intermediaries: professional bodies, networks and representatives

2.4.3. RESPONSES

The survey was carried out over a 3 week period in June 2024 and was promoted via social media post by I4N task lead Melomys Advisory and other project partners. Likewise over 200 known contacts in the financial services sector were approached directly with an invitation to provide contributions to the survey. As at June 25, 2024 the survey had gathered 65 responses, out of which 51 were from eligible respondents – those affiliated with financial sector entities. 40 were considered sufficient quality responses and were included in the analysis. The results of the survey are presented in Chapter 5.

2.5. DESCRIPTION OF NBE SURVEY

The Nature-based Enterprise survey data presented in chapter 6 is based on responses received between January and April 2024 to a publicly available survey which builds on and updates previous research (Kooijman et al., 2021; McQuaid et al., 2021). The survey consisted of 34 questions in 4 sections: questions 1 - 12 focused on general enterprise characteristics; questions 13 to 16 on market structure and trends; questions 17 - 26 on financing and business models; and questions 17 - 32 on education, training and support.

The survey was distributed through the networks of Connecting Nature Enterprise Platform (CNEP) members, Invest for Nature partners, at events such as Nature Futures 2024, during webinars hosted on CNEP, and via social media (LinkedIn and X). Of 176 survey responses, 125 were included in the analysis. The reasons for exclusion of responses were: low data quality and completeness (7); duplicate responses (2), and organisations not fitting the NbE definition - e.g. Universities, public sector bodies, not engaged in economic activity, or not nature-based (42). All inclusion/exclusion decisions were assessed by a minimum of two members of the research team. There were no geographical restrictions to participation, but recruitment prioritised European networks.

Free text data was analysed by importing survey responses into a qualitative data analysis tool (MAXQDA) and carrying out inductive coding, initially by question, and then across the data set to ensure connections within responses and between questions were retained. Initial coding was completed by one researcher, with coding subsequently reviewed, discussed and further developed by the multidisciplinary research team, to build consensus and enhance reliability.

Below you can view a map (Figure 4) that illustrates what countries in Europe were represented in the survey.

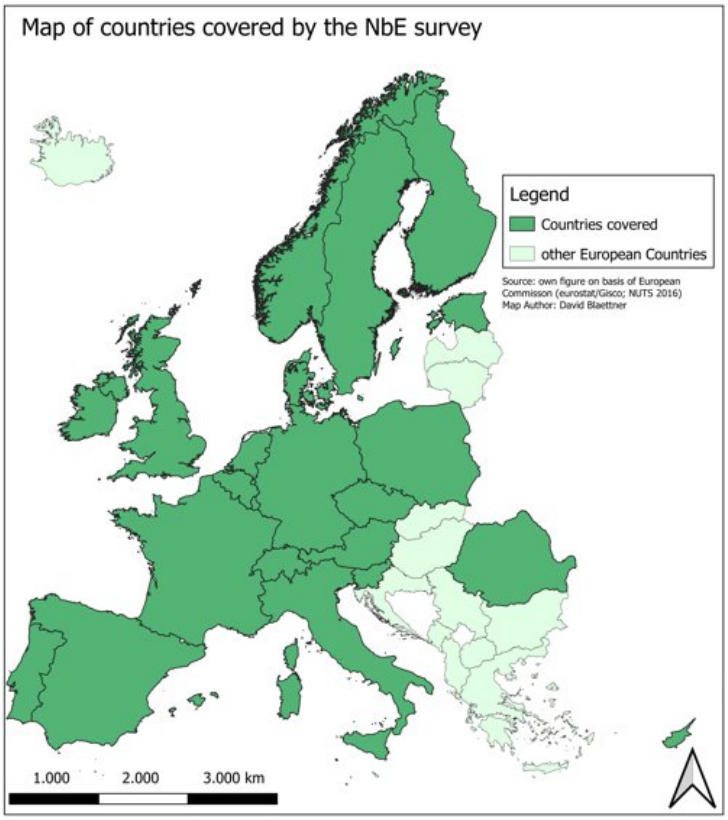

Figure 4. Map of European countries covered by NbE survey; Source: Own figure based on Eurostat/GISCO (NUTS)

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3. CURRENT LANDSCAPE OF NBS FINANCING MODELS AND INCENTIVES

3.1. TRENDS AND PATTERNS IN NBS FINANCING MODELS AND INCENTIVES ACROSS I4N LANDSCAPES AND THEMATIC SECTORS

Traditionally, public funding has been the foundation of NbS projects. Often characterized by their relatively small scale and limited investment (European Investment Bank, 2023), these projects have relied heavily on government budgets, grants, and international aid. Due to the diverse and often non-replicable nature of these projects, ensuring their comparability and scalability to meet the growing demand for environmental restoration and climate resilience remains difficult (de los Casares and Ringel, 2023).

The landscape of NbS financing is evolving, with increasing recognition of the need for more substantial and diversified funding sources (European Investment Bank, 2023). The involvement of the private sector is emerging as a potential solution to these challenges. Private sector participation not only brings additional financial resources but also introduces innovative business models, operational efficiencies, and a focus on measurable outcomes that can enhance the effectiveness and impact of NbS projects.

A key development in this context is the rise of blended finance mechanisms, which go beyond simply mixing public and private investments. These mechanisms strategically combine public and private funds, creating a more powerful financial tool than either source could achieve independently (Green Climate Fund, 2023). Public funds can be used to de-risk investments, making them more attractive to private investors who might otherwise shy away from projects perceived as too risky or with uncertain returns. By mitigating these risks, public financing can play a crucial role in unlocking significant private capital flows into NbS.

Blended finance offers a distinct approach compared to Public-Private Partnerships (PPPs). PPPs establish a long-term contractual relationship where government entities and private companies share responsibilities, risks, and rewards to manage and deliver public projects. In this structure, private investment takes the lead role, with the government potentially offering incentives or guarantees to attract private participation. The primary focus of PPPs lies in delivering the NbS project's infrastructure and services while ensuring a return on investment for the private sector. The table below compares two successful case studies: one utilizing a PPP model and the other leveraging blended finance.

	PPP for Nature-Based Solutions in India (NBA, 2019)	**ACCT Fund for Blended Financing (GIZ, 2023)**
Objective	Address funding gaps for biodiversity conservation	Support tourism operators and promote conservation
Geographical Focus	India	Sub-Saharan Africa
Sectors Involved	Infrastructure, biodiversity, forestry	Tourism, conservation
Funding Model	Public-Private Partnerships (PPP)	Blended Financing
Financial Instruments	Infrastructure Debt Funds, Infrastructure Investment Trusts, equity take-out options	Concessional debt, equity, grants

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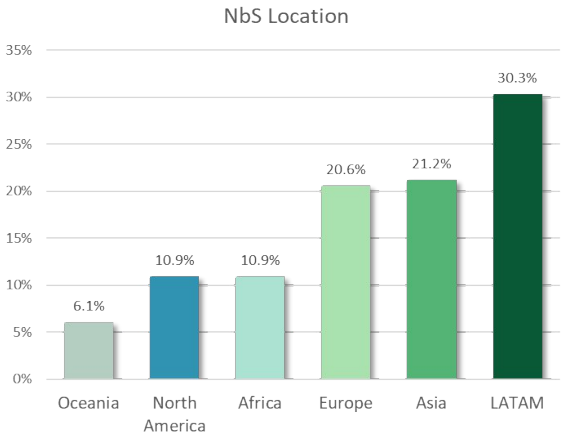
Key Partners	Indian government, private sector partners	The Nature Conservancy (TNC), ThirdWay Partners, KfW Development Bank, USAID, IFC
Challenges	Land acquisition delays, regulatory overlap, financial stress	Loss of income and jobs, potential ecological degradation due to reduced funding
Future Plans	Explore more location-specific PPP models for forestry and conservation	Leverage carbon sequestration for additional revenue streams

However, NbS presents a unique challenge for traditional financial institutions and even "patient" impact investors. The emerging business model for NbS makes it difficult to clearly define return-on-investment, creating a barrier for those seeking a clear financial bottom line. Additionally, the small-scale nature of many NbS projects makes them operationally less attractive to the finance sector.

To address these challenges and better understand the financing landscape for NbS, we have conducted a systematic literature review. The review aims to map the current landscape of peer-reviewed and grey literature on NbS financing models and incentives. The study explores how the landscape and effectiveness of investment vary with NbS type, investment scale, and the specific challenges each NbS addresses, to facilitate the design of future NbS financing strategies. Building on the I4N classification of NbS types and landscapes, detailed in Deliverable 2.1, this chapter synthesizes the findings of the literature review.

In the qualitative analysis stage of the review 165 cases of NbS investment were analysed, with the forest landscape being the most prominent (40%), followed by water management (23%), agriculture (15%), coastal (8%), urban (7%), and mountain (6%) (See Figure 6). This distribution likely reflects the geographical coverage of the reviewed literature, shown in Figure 5, with the highest coverage for Latin America (30.3%), followed by Asia (21.2%) and Europe (20.6%), North America and Africa (10.9% each), and Oceania (6.1%).



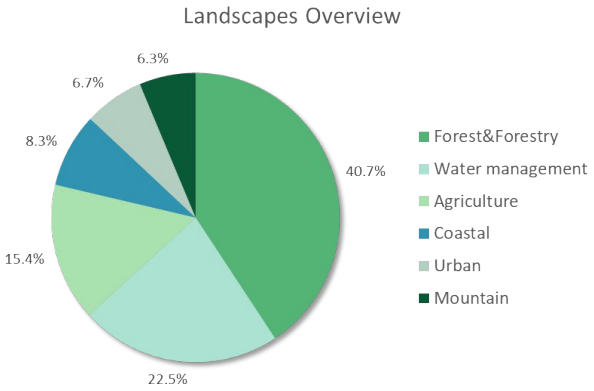


Figure 5. Geographical distribution of NbS cases in literature review

Figure 6. Distribution of NbS landscapes and thematic areas in literature review

Based on the literature review, and in line with the global trends, NbS projects predominantly occur at small scale, representing 52.1% of the total analysed papers (see Figure 7). Medium scale projects account for 27.9% of the papers, while large-scale project constitute only the

20% of analysed cases. This lower percentage reflects the challenges associated with scaling NbS projects to a national or international level, which often require substantial funding, extensive stakeholder engagement, and sophisticated governance structures.

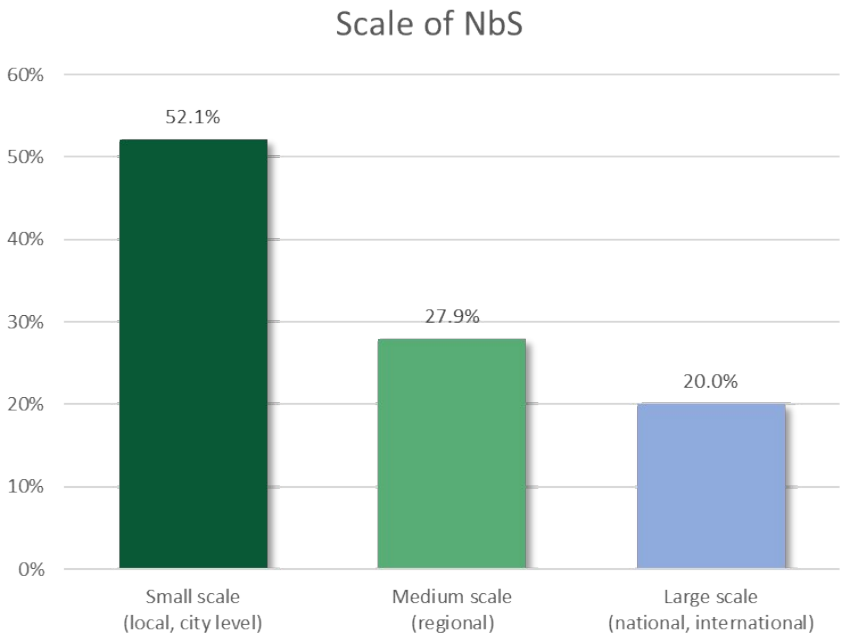


Figure 7. Overview of the scale of NbS in analysed papers

Regarding the level of financing, the data reveals a diverse range of investment scales (see Figure 8). Small-scale (<€2m) and small-medium scale (€2-4m) investments represent together 40% of the cases, while medium-large (€8-12m) and large-scale investments (>€12m) constitute 23.6% of the cases. This suggests that while there are notable large investments, the majority of projects are still operating with relatively modest budgets, which aligns with the predominance of small-scale projects observed earlier. However, the largest category is the significant proportion of cases for which the level of financing is not available (NA=34.5%), highlighting a critical area for improvement. This shows a substantial gap in data transparency, which inhibit a full understanding of the financing landscape and underscores the need for improved financial reporting and data collection in NbS projects to better inform future investment strategies.

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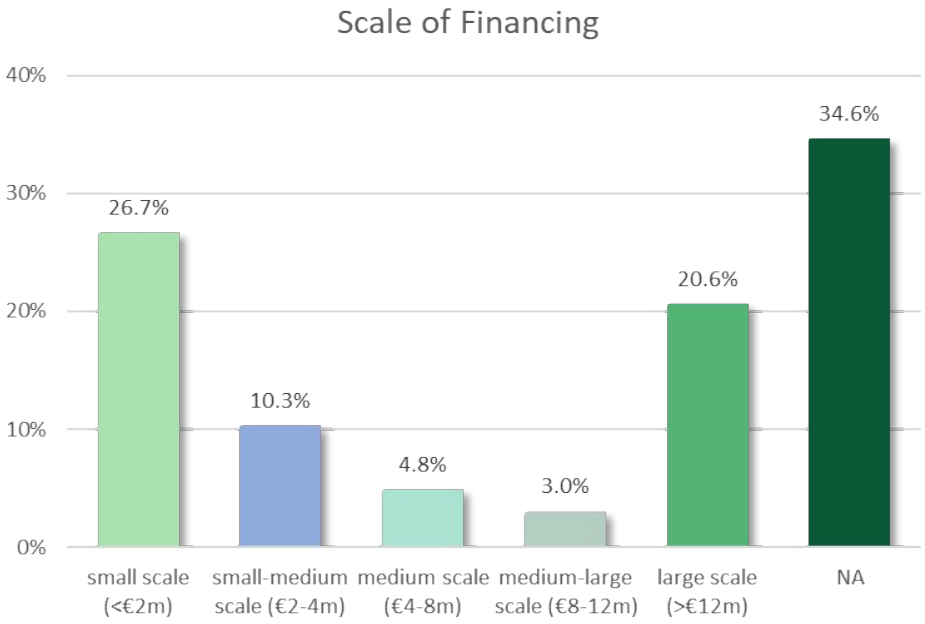

Figure 8. Overview of scale of financing in literature review

Public funding emerges as the predominant source of financing in the NbS market, accounting for 45% of cases (Figure 9). This is followed by cases with a mix of public and private financing (29%), private funding as the only source for 18% of cases, and blended financing for the remaining 7%. Notably, the private sector, both alone and combined with public funds, totals 64% of cases, highlighting the increasing recognition of the economic potential of sustainable management practices.

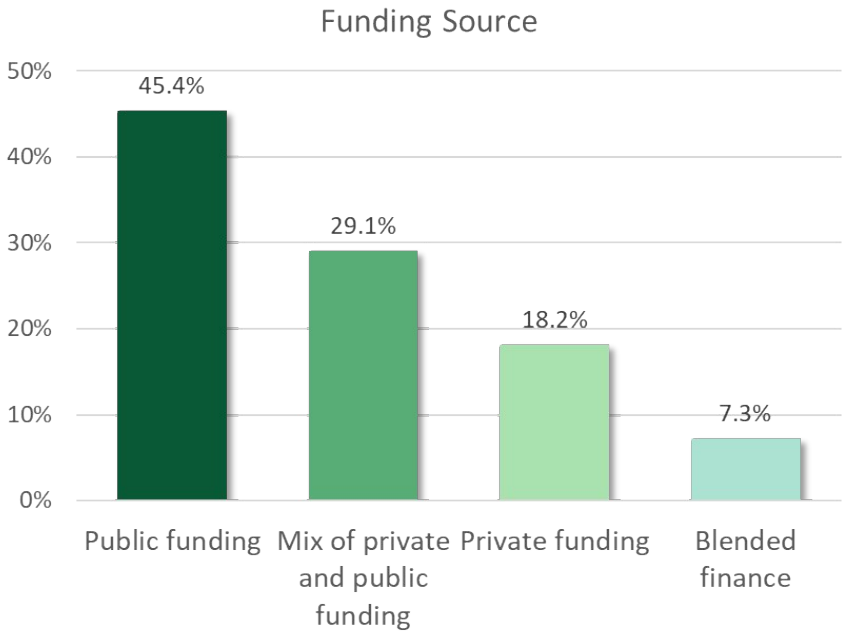

Figure 9. Distribution of funding sources for NbS cases analysed in literature review

Regarding the financing instruments (Figure 10), Payments for Ecosystem Services (PES) were the most common financing instrument across all NbS sectors, present in 40.5% of

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cases. This is followed by incentives (20.2%), tradable credits (9.3%), fees and taxes (7.5%), grants or donations (6.4%) and Rewards (5.8%). Green bonds appeared less frequently, in 2.9% of the cases. These instruments will be further analysed in Section 3.3.

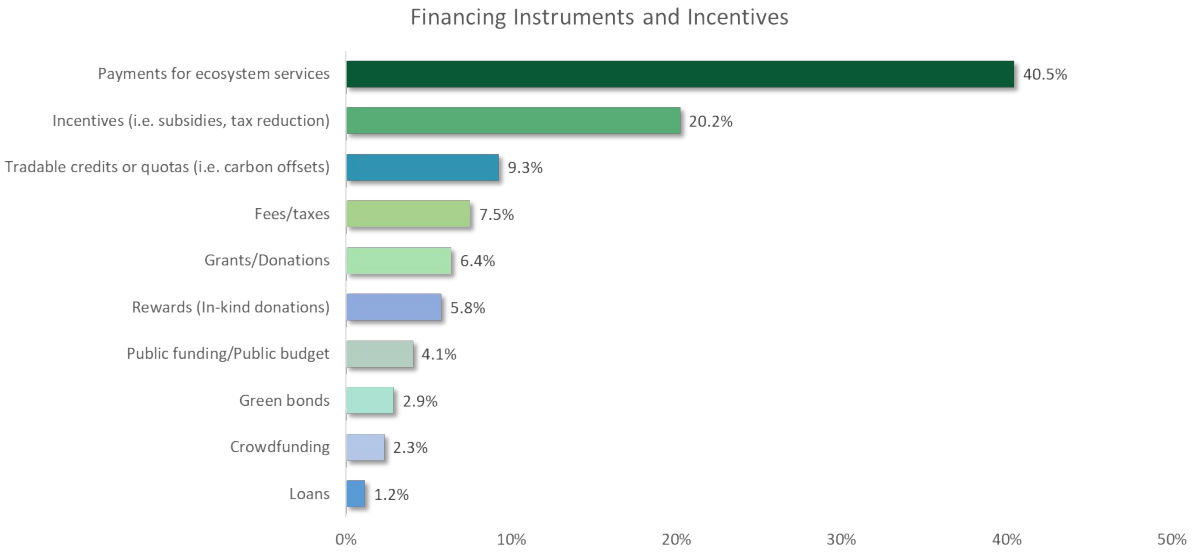

Figure 10. Distribution of financing instruments and incentives in reviewed papers

Our analysis also delves into the different characteristics of financing for NbS across various landscapes. Europe leads the way in urban NbS implementation, accounting for 88% of reviewed cases. Urban NbS such as green roofs, parks, and ponds are primarily implemented at the local level (70% of reviewed cases). Public funding dominates this sector, utilizing instruments like public budgets and incentives (reduced storm water fees, property tax allowances, co-financing of green roofs). However, enforcing these incentives remains a challenge, requiring innovative solutions to achieve scale-up and replicability. While there is no 'one-size-fits-all' approach that can be applied everywhere (Colléony and Shwartz, 2019), common challenges can be addressed with context-specific solutions. Sub-chapter 3.3 delves deeper into the specific drivers and challenges associated with NbS implementation and financing.

The reviewed mountain NbS cases address issues like livestock management, soil conservation, and land-use conversion. These initiatives vary in scale, with local scale representing 50% of the cases analysed. Funding sources are a mix of public and private (37.5% of cases), public only (37.5% of cases), and private only (25% of cases). Geographically, Latin America (50%), Asia (31%), and Europe (19%) is where most cases are of mountain NbS development were found. Key financing instruments include payments for ecosystem services and in-kind donations (materials, assistance, and training).

Coastal NbS cases encompass projects like mangrove restoration, beach nourishment, and biodiversity protection. Implementation scales vary, with local (57%), medium (24%), and large-scale (19%) projects. Funding sources are diverse, with private (33% of cases), mixed public and private (29% of cases), public only (24% of cases), and blended finance (14% of cases). Prominent regions include Asia and Europe, with 43% and 24% of the cases respectively. Visitor fees and grants are common financing instruments in this landscape.

Agricultural NbS cases focus on agro-forestry, silvo-pastoral practices and sustainable land-use management. Latin America (44%) and Asia (18%) are the main regions, with projects

ranging from local (51%) to medium (26%) and large-scale (23%). Public funding dominates (56% of cases), followed by mixed public and private (26%) and private only (18%) sources. Financing instruments include PES, incentives, and in-kind donations (support, technical assistance, equipment, and livestock). Ensuring long-term success in this sector often requires the implementation of enforcement mechanisms or penalties.

Water management NbS vary in scale, with local (61%), medium (23%), and large-scale (16%) initiatives. Geographically, Latin America (56%) and Asia (18%) are at the forefront. Public funding remains significant (54% of cases), followed by mixed public and private (28%), private only (11%), and blended finance (7%). Common financing instruments include PES, in-kind donations (training, equipment, agricultural inputs), and incentives (subsidies, cash payments).

Encompassing a wide range of activities from sustainable forest management to ecological restoration, forest and forestry NbS projects make up the most prominent category within the reviewed literature (40% of cases). These initiatives vary in scale, with local (51%), medium (26%), and large-scale (23%) projects addressing diverse challenges. Geographically, a significant portion of forest and forestry NbS projects are concentrated in Latin America (44%) and Asia (18%). Common financing instruments include PES (32%) and incentives and subsidies (25%).

3.2. EXPLORING HOW LANDSCAPE AND INVESTMENT EFFECTIVENESS VARY WITH NBS TYPES AND INVESTMENT SCALES

Building on the insights from the previous sub-chapter, this section delves deeper into the relationship between landscape, NbS type, investment scale, and project effectiveness. The review found that 45.1% of the analysed cases did not provide sufficient information on the financial success of the projects, often due to the projects being in initial phases where it was too early to collect such data (see Figure 11). Among the cases that did report on outcomes, 34.1% reported successful outcomes, 4.3% indicated failure, and 16.5% had mixed results.

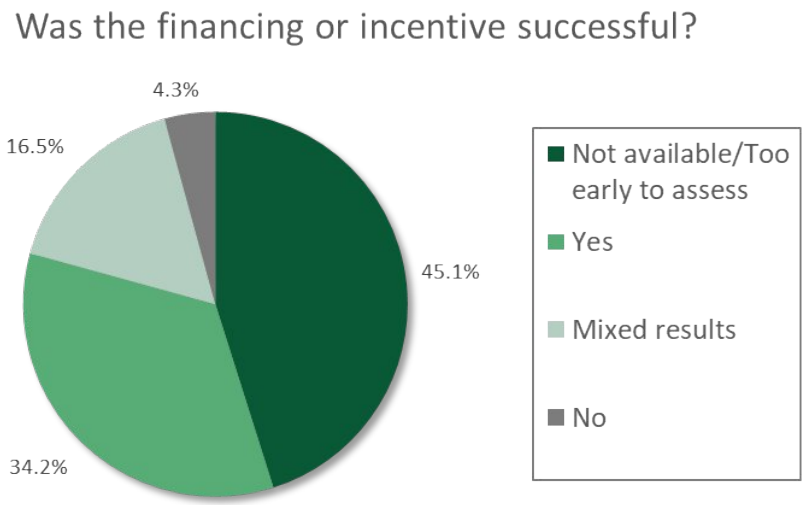

Figure 11. Breakdown of financing or incentives success rates in reviewed literature

The most frequent indicators for successful NbS projects included achieving conservation and ecological benefits, followed by economic resources and financial gain, and livelihood benefits. Scalability was also mentioned as a factor in successful cases. Conversely, the primary indicators for project failure included a lack of observed ecological improvements, inadequate funding or absence of economic benefits, and human factors such as luck of trust or unclear roles among stakeholders. Projects with mixed outcomes often reported issues such as limited or no "additionality"[1], increased conflicts, lack of livelihood benefits, and wasted resources.

As a general observation, it is important to note that the high presence of successful cases in the literature might also reflect a general tendency to report more on successful outcomes than failures. This reporting bias can distort the perceived effectiveness of NbS projects and highlight the need for more comprehensive and balanced evaluations.

When analysing the effectiveness of NbS in relation to the scale of investment (Table 4), success or failure rates appear evenly distributed across small and large-scale investments, indicating no clear patterns based on investment size.

Was the financing successful?	Small scale (<€2m)	Small-medium scale (€2-4m)	Medium scale (€4-8m)	Medium-large scale (€8-12m)	Large scale (>€12m)
Yes	14	6	2	1	15
Mixed results	4	2	1	3	7
No	0	0	0	0	2

Table 4. Effectiveness of NbS in relation to investment scale

Table 5 below presents an analysis of the effectiveness of NbS cases across different landscapes:

Was the financing successful?	Coastal	Agriculture	Water management	Forest & Forestry	Urban	Mountain
Yes	6	21	15	34	5	6
Mixed results	1	7	12	21	0	1
No	0	2	1	6	1	0

Table 5. Effectiveness of NbS in relation to the landscape (number of NbS cases)

Analysed cases in coastal, mountain, and urban landscapes were mostly successful. However, it is important to note that the literature review covered few cases in these landscapes, which

[1] Additionality is a concept commonly used in the evaluation of environmental projects and policies. As defined by the IPCC (Intergovernmental Panel on Climate Change, 2014) "*Mitigation projects, mitigation policies, or climate finance are additional if they go beyond a business-as-usual level, or baseline*". In the context of nature-based solutions projects, additionality assesses whether the project's outcomes represent an enhancement of conservation or ecological benefits beyond what would have naturally happened or been achieved through existing practices or policies.

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limits the statistical relevance of the successful outcomes. Despite this, it is noteworthy that no failures were reported for coastal and mountain landscapes, suggesting that projects are generally well-implemented, possibly due to clear objectives such as mangrove restoration and beach nourishment for coastal areas, and soil erosion prevention for mountainous regions. However, the limited number of projects also indicates the need for further investment and scalability.

In contrast, forest and water management landscapes registered a higher number of analysed cases with mixed results. NbS in forest landscapes, driven by well-established financing programs like PES, show a high success rate. However, the complexity of land rights and community conflicts can lead to mixed results. PES and subsidies provide financial incentives for conservation and can offer security for project continuity and stability, but their implementation can be challenging potentially resulting in lower additionality.

The data indicates that certain landscapes have higher success rates, possibly due to established methodologies and a longer history of implementation. In agriculture, where PES have been a prevalent instrument, NbS cases have shown success in achieving both ecological and socio-economic benefits, including improved livelihoods for local communities and increased land productivity, encouraging the replicability of such initiatives. This suggests that when financial incentives are aligned with sustainable land management practices, as often seen in PES schemes, the outcomes can be particularly positive.

3.3. ANALYSIS OF DRIVERS AND BARRIERS ASSOCIATED WITH DIFFERENT FINANCING MODELS AND INCENTIVES

This section provides a comprehensive analysis of the key drivers and barriers associated with various financing models and incentives. It will focus on the instruments that emerged as prevalent from the literature review, such as Payments for Ecosystem Services, incentives and tradable credits. Additionally, we include green bonds in the analysis due to their relevance to our research to understand needs and motivations of the private sector in financing NbS.

3.3.1. PAYMENTS FOR ECOSYSTEM SERVICES

Introduced with Costa Rica's pioneering program in the late 90's (Prokofieva, 2016), Payments for Ecosystem Services have emerged as a market-based approach for addressing environmental challenges. A typical PES contract involves an ecosystem service provider (e.g., landowners), beneficiaries or users (e.g., downstream water users, urban residents), and intermediaries or donors who facilitate the transactions and provide funding (e.g., government). Rather than delving into the mechanics of PES, which have been extensively covered in the literature, we will focus on the factors that promote or hinder the success of PES across different landscapes.

Barriers

A key obstacle to effective PES implementation is the undervaluation of ecosystem services (Sarkki, 2011; Scullion et al., 2011; Gaglio et al., 2023). Since the vast benefits provided by ecosystems are often not priced in traditional economic models, they are underestimated and not assigned a proper value. In urban landscapes, for example, green areas generate multiple ecosystem services such as air purification, temperature regulation, and recreational spaces. However, as highlighted by Croci et al. (Croci, Lucchitta and Penati, 2022), the underestimation leads to inadequate financial resources being allocated for PES agreements, significantly below the public's willingness to pay for maintaining and managing these green spaces.

Another significant challenge lies in accurately monitoring both implementation and outcomes of PES schemes (Jennifer M. Alix-Garcia, Shapiro and Sims, 2012; dos Santos et al., 2020; Jia et al., 2022). This can depend on the lack of data or limited government capacity to analyse it (Thompson, 2019; McElwee, Huber and Nguyễn, 2020), as well as technological limitations. For instance, in programs aimed at reducing deforestation, remote sensing technology may not effectively monitor deforestation at the household level, making it difficult to ensure compliance with PES agreements for small-scale landholders (Silva-Muller, 2022).

The lack of robust monitoring adds another layer of risk for the private sector when considering PES investments. Without clear data on the environmental impact and long-term benefits, businesses are hesitant to invest in what they perceive as uncertain financial returns. This reinforces the misconception of ecosystem services as philanthropic initiatives, rather than market-based and profitable opportunities (Suich et al., 2017).

A common barrier across various landscapes is the asymmetry of information and lack of understanding among participants regarding PES contracts (Jennifer M. Alix-Garcia, Shapiro and Sims, 2012; Fisher, 2012; Jayachandran et al., 2017; Fernandes et al., 2022). Many landholders and local communities lack the knowledge or experience to fully grasp the terms of agreements, leading to mistrust and suboptimal participation. Capacity-building and simplified language can help mitigate this issue.

Drivers

A key element for successful PES implementation that emerged from the literature review is stable funding combined with robust institutional architecture and well-defined legal and policy frameworks, at both national and local levels (Nelson et al., 2010; Yang et al., 2013; Suich et al., 2017; Joslin, 2019; Fernandes et al., 2022; Silva-Muller, 2022). As an example, Vietnam's Decree 99 mandates hydro-power companies, water supply companies, industrial water users, and tourist companies to be buyers of ecosystem services, providing a regulatory pillar that ensures consistent demand and funding for PES initiatives (McElwee, Huber and Nguyễn, 2020). Similarly, Costa Rica's Forestry Law Nº7575 established a PES program in response to the country's deforestation crisis. This law explicitly defines the types of ecosystem services (e.g., biodiversity, water, carbon sequestration, scenic beauty) that can be compensated through PES, and integrates the PES system within the broader forestry legal framework and related regulations (Liagre et al., 2021).

Another important enabler is the creation of strong networking between local organizations, local leaders and local communities. Influential intermediaries, often NGOs, play a vital role in initiating and sustaining PES programs (J. M. Alix-Garcia, Shapiro and Sims, 2012; Ingram et al., 2014; Goh and Yanosky, 2016; Thompson, 2019). This aspect is illustrated well in the Mexican Cloud Forest case (Denham, 2017), where PES has been implemented through existing traditions of community organizations, such as assemblies and *tequios*. These assemblies coordinate conservation initiatives, decide on land use practices, and determine how PES funds are distributed, ensuring community involvement and acceptance.

This focus on community engagement is reflected also in the importance given to participatory decision-making processes. Ensuring that decisions are made with the involvement of the community and all stakeholders fosters trust and cooperation, which are essential for the long-term success of these programs (Joslin, 2019; Liagre et al., 2021; Arias-Arévalo and Pacheco-Valdés, 2022). An example of this is seen in Tanzania, where the unique village governance structure allows communities to define land rights and participate in clear decision-making

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processes, facilitating the establishment of a PES program focused on land use (Nelson et al., 2010).

Additionally, the benefits generated by PES programs are particularly critical for communities in developing countries and vulnerable regions. These programs can significantly enhance the livelihoods of rural households by providing them with additional income streams, making them a powerful driver for the adoption and success of such schemes (Dougill et al., 2012; Chen et al., 2019; Senadheera, Wahala and Weragoda, 2019).

3.3.2. INCENTIVES

Market-based incentives are being employed to make NbS more attractive and economically viable. These financial instruments take various forms, from direct payments, like subsidies, for actions like tree planting or wetland restoration, to tax breaks for land conservation and renewable energy investments. The primary goal of these incentives is to make NbS more affordable and environmentally harmful activities less appealing.

Barriers

Similar to PES schemes, a significant barrier to the effective exploitation of incentive programs is the weakness of monitoring systems, which complicates the measurement of program success and increases the uncertainty of the outcomes (Bremer et al., 2016; Burszta-Adamiak and Fiałkiewicz, 2019; Báliková and Šálka, 2022). For instance, Drescher et al. (2019) highlight a key issue: when evaluating the impact of conservation incentive programs on private land management of invasive species, most studies focus on program outputs, such as the number of enrolled landowners or workshops held, rather than outcomes, like changes in landowner conservation behaviours or ecological recovery.

One challenge linked to the lack of monitoring processes is the issue of limited enforcement and non-compliance with program terms (Young and Castro, 2021; Charnley, 2023). For example, a land conservation program in the Bolivian Andes (P Bottazzi et al., 2018) faced this problem when participants continued cultivation or cattle grazing despite regulations, undermining the program's effectiveness and credibility if participants can disregard its core objectives.

Dependence on public funding also poses a challenge, as it can hinder the long-term sustainability of conservation efforts. The reliance on government payments can create uncertainty and instability, making it difficult to maintain conservation activities once the funding ceases (Bremer et al., 2016; Young and Castro, 2021).

The lack or asymmetry of information further complicates the implementation of incentives. This issue can manifest as a lack of knowledge about the program, the benefits for participants, or the administrative requirements needed to access these incentives (I Ferguson et al., 2016; Burszta-Adamiak and Fiałkiewicz, 2019; Báliková et al., 2021; Fernandes et al., 2022). Additionally, the complexity and transaction costs associated with accessing incentives can be deterrents. Programs with complicated application processes, stringent eligibility requirements, or long wait times can discourage participation.

Drivers

Key among the driver factors is the motivation and participation of people, which forms the foundation for any successful program. Engaging the community and ensuring their willingness to participate is crucial (P. Bottazzi et al., 2018; Sherren et al., 2020; Lichtenberg, 2021). Education and training programs also serve as essential tools for motivation, helping to

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improve awareness and skills needed for program participation (Burszta-Adamiak and Fiałkiewicz, 2019; Young and Castro, 2021).

Beyond community engagement, strong national legislation emerges as another critical driver for NbS programs, providing a solid foundation for incentive programs to build upon. GründachPLUS is a funding scheme by the Berlin Senate Department for Environment, Transport and Climate Action to promote green roofs. Subsidies are available for greening roofs larger than 100 square meters in specific areas of Berlin. The scheme supports urban gardening, roof renovations, and greening of new builds, especially in inner-city areas with limited open space and high pollution. Furthermore, this program encourages the integration of energy efficiency measures with roof greening projects, offering an opportunity to maximize financial support by combining multiple funding schemes and enhancing the overall impact and benefits of the project.

Financial benefits also play a significant role that can substantially reduce the upfront costs (Burszta-Adamiak and Fiałkiewicz, 2019) associated with adopting new behaviours or technologies. New York City's green roof tax benefit program offers a property tax reduction of 20% of the value of a green roof for up to ten years. This directly reduces the cost of installing and maintaining a green roof, making it a more attractive option for property owners. The program has been credited with contributing to a significant increase in green roof installations across the city, providing benefits like improved air quality, reduced storm water runoff, and habitat creation for pollinators (Treglia et al., 2022).

3.3.3. TRADABLE CREDITS

Tradable credits, particularly within the carbon market, represent a growing approach to incentivise sustainable practices and mitigate climate change. These markets allow entities to buy and sell credits representing a quantifiable environmental benefit, such as a reduction in greenhouse gas emissions (carbon offsets) or improvements in biodiversity (biodiversity offsets). Carbon credits focus on reducing emissions through projects like peatland restoration, or reforestation, while biodiversity offsets aim to compensate for habitat and species loss by creating or restoring natural areas.

Barriers

Implementing carbon credits in NbS projects faces significant challenges, largely due to a lack of comprehensive understanding, which complicates the establishment of robust and reliable initiatives (Kuwae et al., 2022). A critical issue is the difficulty in aligning the interests and capacities of diverse stakeholders. For instance, the Mozambique PES project, designed for carbon sequestration, struggles to balance the demand for carbon certificates with landholders' willingness to supply these services, highlighting the complexities in coordinating and incentivising participants (Dougill et al., 2012).

Furthermore, accurately measuring and verifying carbon sequestration is both complex and costly. Community resistance, particularly due to land use changes, can significantly impede project implementation. Lastly, the fragmented nature of carbon markets further limits the scalability of NbS projects, necessitating better integration to enhance market efficiency and project viability.

Unlike carbon credits, which can be quantified in terms of CO_2 emissions, biodiversity credits lack a common currency (Rao, Choi and Czebiniak, 2024). Biodiversity encompasses diverse elements, making standardization and consistent measurement difficult, with regulatory agencies struggling with determining appropriate compensation (Bose, 2021). Additionally,

biodiversity offset markets often result in negative impacts being displaced geographically, as mitigation banks generate credits far from the impacted areas. This raises concerns about the effectiveness of restored ecosystems in genuinely replacing lost biodiversity (Bose, 2021).

Drivers

The effectiveness of credit markets depends on several factors. Robust monitoring systems are crucial to ensure the environmental integrity of these credits. Additionally, clear standards and regulations are necessary to prevent greenwashing and ensure the credibility of the market.

Drivers of biodiversity offset markets stem from increasing environmental regulations. Policies like the US Clean Water Act, which restricts development impacting wetlands, create a need for compensation (Bose, 2021). Developers seeking permits can turn to mitigation banks, a form of biodiversity offset, to fulfil these requirements.

Additionally, increasing expectations from stakeholders for companies to report on their nature-related risks and dependencies drive corporate engagement in biodiversity and carbon credit markets. The Kunming-Montreal Global Biodiversity Framework, adopted by 196 countries, commits to halting and reversing biodiversity loss by 2030, redirecting subsidies towards biodiversity, and mobilizing additional funds for conservation. Many Fortune 500 companies are recognizing biodiversity loss in their sustainability reporting, creating a need to meet these targets through credits and offsets (Rao, Choi and Czebiniak, 2024).

The presence of verification and certification procedures by third parties is another crucial enabler. These procedures add security for credit buyers, increasing the recognition, perceived reliability, and overall value of the market. Organizations like PLAN VIVO play a significant role in this aspect. For instance, in Uganda and Malawi, Plan Vivo projects have acted as catalysts in attaining community land titles for community forests and in generating community forest management plans, providing benefits at different scales (Peskett, Schreckenberg and Brown, 2011; Joosten et al., 2015). The establishment of integrated information systems and registries where data can be collected, analysed, and used to support investment decisions is also vital. Such systems provide evidence that supports the credibility and attractiveness of the market for potential investors (Young and Castro, 2021).

A key motivator for participants is the additional opportunities and sources of income linked to the selling of credits. For example, in forest management sustainable timber production has become a driver of offset contracts (Fouqueray et al., 2021; Shinbrot et al., 2022), making participation in carbon markets more attractive for landowners and other stakeholders. Technical assistance provided to participants is also essential. Guidance and support in navigating the complexities of carbon markets can enhance participation and ensure that projects are effectively implemented (Shinbrot et al., 2022).

3.3.4. GREEN BONDS

Green bonds are a type of debt-financing instrument specifically designed to raise capital for projects with environmental benefits, aligning investor interest with sustainability goals (Jiang et al., 2022). These bonds have emerged as a prominent mechanism for directing funds towards Nature-based Solutions and are particularly suited for large scale projects requiring upfront costs and assets such as infrastructure (Bose, 2021). The green bond market has experienced significant growth, exceeding $500 billion in annual issuance by 2021, according to Climate Bonds Market Intelligence (Climate Bonds Initiative, 2022).

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Barriers

One significant barrier to the widespread adoption of green bonds is the uncertainties linked with the emerging status of the market. These bonds often rely on new or volatile markets, which can lead to uncertain revenue streams, increasing enterprise risk, and deterring potential investors (Thompson, 2023).

As highlighted by Miola et al. (2021), current data on the environmental benefits of NbS projects financed by green bonds often relies heavily on self-reported metrics from bond issuers and on voluntary guidelines (Bose, 2021). Suzano, a major player in the global paper and pulp market, issued green bonds to finance projects related to sustainable forest management. The company operates extensive eucalyptus plantations across various states in Brazil. More than 90% of the funds raised through these green bonds were allocated to activities labelled as sustainable forest management. This includes maintaining and expanding certified forest areas and purchasing certified timber for commercial products (Miola et al., 2021). However, the critique lies in the lack of specific information about the exact territories where these green bond proceeds are invested. The assumption is made that these "green revenues" could potentially be used in uncertified or already certified areas within the planted area. The paper points out that the reports from Suzano and other issuers do not provide detailed insights beyond the self-reported carbon metrics (Miola et al., 2021). Additionally, the authors criticize the focus on carbon sequestration as a primary metric for green bonds, suggesting that this oversimplifies the complex ecological impacts of forestry practices. As reported also by Kuhlmann some green bonds have financed large tree plantations in Brazil, but these might not be as effective in capturing carbon as claimed (Kuhlmann, Mark and Baffoni, 2019).

To add to this, many investors are still unfamiliar with the concept of green bonds, and a lack of clear definitions for "green" projects coupled with inconsistent disclosure practices creates uncertainty, making it difficult for investors to assess the viability and impact of green bond-funded projects (Verma and Agarwal, 2020).

Additionally, while green bonds are designed to provide a relatively secure cash return to investors, the terms can vary significantly. Shorter-term bonds may be suitable for certain projects like solar installations, whereas longer-term bonds are necessary for projects like reforestation, which require extended timelines to realize both revenue and environmental impacts.

Drivers

Despite these challenges, several drivers can enhance the attractiveness and effectiveness of green bonds in financing NbS. One major driver is the establishment of certifications and standards that facilitate the issuance of green bonds, increasing their credibility and reliability. The existence of robust frameworks and guidelines, such as the Green Bond Principles, albeit loosely defined (I. Ferguson et al., 2016), provides a foundation for the issuance and monitoring of green bonds, enhancing investor confidence.

Legislative and policy measures can also play a crucial role. For example, National Plan for the Development of Forest Plantations (Decreto Nacional No. 8.375/2014) in Brazil encourages investment in green bonds by promoting the forestry sector, providing various incentives for both issuers and investors (Miola et al., 2021).

The clear and measurable environmental benefits associated with green bond-funded projects are another significant driver. As investors increasingly seek Socially Responsible Investing (SRI) opportunities, green bonds offer a way to align financial goals with environmental

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benefits. This growing trend towards SRI is driven by a rising awareness and demand for investments that contribute positively to the environment (Verma and Agarwal, 2020).

Environmental Impact Bonds (EIBs) exemplify a win-win instrument in this context (Bose, 2021). By attracting private capital to fund NbS project, EIBs not only shift execution risks away from governments but also ensure that investors see returns only upon successful achievement of predetermined environmental outcomes. This mechanism represent an instrument pursuing efficiency and able to align financial incentives with environmental conservation goals.

3.4. POLICY RECOMMENDATIONS FOR DESIGNING FUTURE NBS FINANCING MODELS AND INCENTIVES

Based on the findings of the literature review, this section provides policy recommendations aimed at enhancing the effectiveness and scalability of NbS projects by addressing the identified barriers and leveraging the drivers for success.

A key finding from the literature is the heavy reliance on public funding, which can limit the scope and scalability of NbS projects. To address this, a diversified financing approach that incorporates both public and private sources is crucial. Blended finance mechanisms offer a strategic solution by combining public and private investments. These mechanisms can de-risk NbS projects, making them more attractive to private capital, ultimately expanding the available funding pool for NbS initiatives.

Investors need confidence in the stability and predictability of the policy environment surrounding NbS projects. This includes establishing clear standards for NbS, creating regulations that facilitate private sector participation, and ensuring stable and long-term funding mechanisms at both national and local levels.

Effective monitoring and evaluation systems are vital for tracking the implementation and outcomes of NbS projects. These systems should capture both ecological and socio-economic outcomes, providing comprehensive insights into the performance of NbS initiatives. To reduce information asymmetry and ensure transparency, standardized reporting mechanisms should also be implemented. These mechanisms will provide consistent and comparable data on the performance and impacts of NbS projects, enabling better decision-making by investors, policy-makers, and other stakeholders.

Different landscapes and sectors present unique challenges and opportunities for NbS, shaping the suitability of various financing instruments. For example, in forestry, integrating PES with strong legal and institutional frameworks can help overcome challenges related to land rights and community conflicts. In water management, combining public funding with market-based incentives can address funding gaps and improve project sustainability. By aligning financing instruments with the unique needs of each landscape and sector, we can enhance the overall effectiveness and impact of NbS initiatives.

Capacity building emerged as an essential factor for the successful implementation of NbS projects. Providing training and technical support to project developers and local communities empowers them to participate effectively in NbS initiatives. This includes enhancing their understanding of NbS concepts, building skills for project implementation and management, and fostering community engagement.

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The current state of the market limits the availability of financing instruments to a few commonly used ones, such as PES and public subsidies. While these mechanisms play a role, their focus often falls short of supporting the long-term, stable funding streams required for large-scale NbS projects to achieve financial sustainability. To address this gap, there is a need to diversify the range of available financing instruments. Options like debt financing through loans and bonds can supply the upfront capital required, which often pose a significant barrier for potential participants. Additionally, incorporating performance-based incentives would tie financial rewards to the successful delivery of environmental benefits by NbS projects, ensuring more effective and sustained outcomes.

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4. PUBLIC SECTOR ANALYSIS[2]

4.1. OVERVIEW OF PUBLIC SECTOR FINANCING IN THE NBS MARKET

Despite the critical importance of NbS, current investment levels are insufficient to meet the financial requirement to limit global warming to 1.5 degrees by 2050 and halt biodiversity loss (United Nations Environment Programme, 2022). Isbell et al. (2022) warn that without drastic action, biodiversity loss will continue, threatening or driving to extinction 37% of species by 2100. However, if investments in nature conservation were significantly increased immediately, this figure could be reduced to 25% (Isbell et al., 2022).

Ecosystem services and nature restoration represent immense future economic value that can be delivered by NbS. NbS provide a multitude of benefits that are crucial for society, including clean air, water purification, flood regulation, and improved human health. For instance, urban green spaces can reduce air pollution by filtering particulates and lower the temperature reducing the effects of heat islands. Nevertheless, the financial flows that harm nature far exceed the investments in the NbS sector: almost 7 trillion dollars flow into harmful activities, compared to only 200 billion dollars for NbS. This imbalance also exists in the area of public finances: globally, public funds spent on environmentally harmful sectors are ten times higher than those spent on NbS (United Nations Environment Programme, 2023).

Given the pivotal role of public sector financing in NbS, key questions arise:

- What financing options are available to public institutions?
- What barriers prevent increased public investment in NbS?
- What influence do the different governance levels (local, regional, national, European) have on the implementation of NbS projects?
- How can the perceived obstacles be overcome to enhance public sector engagement in NbS?

The subsequent chapters will explore the results of the interviews with representatives of the public sector, highlighting drivers and development potentials. This will be followed by policy recommendations to emphasize existing opportunities and provide insights on overcoming specific hurdles based on interviewee perspectives.

4.2. ANALYSIS OF EXISTING FINANCING INSTRUMENTS AND INCENTIVES IN PUBLIC SECTOR PROJECTS

In line with previous research, all public sector interviews indicated that public financing plays the biggest role in NbS financing. EU legislation is creating new opportunities, especially through public-private partnerships, that could significantly boost investment in NbS. Public budgets are often supported by available funding schemes, which substantially influence NbS investment and implementation across all governance levels, from local to international. The in-depth interviews carried out by I4N partner NIVA, involving seven respondents from the

[2] Sections 4.3, 4.4 as well as 4.6 have been written as part of a master thesis by David Blaettner, JR. “Boosting public nature based solutions finance and exploring synergies with circular economy strategies - perspectives within the Horizon Europe Project Invest4Nature” carried out at the University of Graz.

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public sector, private sector, and research institutes, provided additional insights. These respondents, all working with coastal and marine ecosystem conservation and restoration in Norway, highlighted that innovation efforts and restoration activities related to kelp restoration are funded mostly by public research and innovation funds, including European, national, and regional funds.

There are mainly two forms of financing when it comes to public sector involvement: full financing from the earmarked government budget and joint or blended financing with the private sector. Full financing from government budget has been the most common form of support for the restoration activities of blue forests in Norway. This includes research funds or other earmarked government funds, such as budgets allocated for marine protected areas to carry out various conservation and restoration measures. This type of financing is typically available for public sector projects.

Blended financing with the private sector is also significant. Several funding programs relevant to blue forest restoration and conservation in Norway do not cover all project costs. Instead, they require own contributions, either in the form of in-kind contributions or monetary terms, with coverage percentages varying from 25% to 50%. In most projects under such funding schemes, private sectors, research institutes, and public sectors collaborate. This type of financing is available for private sectors and SMEs and is particularly popular among SMEs seeking additional funding for product development, especially in the initial stages.

4.3. DRIVERS AND MOTIVATORS

Because of their multiple benefits, NbS are effective measures to tackle various challenges simultaneously. NbS can mitigate and adapt to climate change, counteract the hazards of extreme weather events, and promote social well-being, health, and biodiversity. These benefits often translate to positive economic impacts, although the precise financial value of specific NbS investments can be difficult to quantify. Notably, the key drivers identified in the literature resonate with the experiences shared by interview participants. Figure 12Figure 11 provides a visual representation of the most frequently mentioned categories in the interviews:

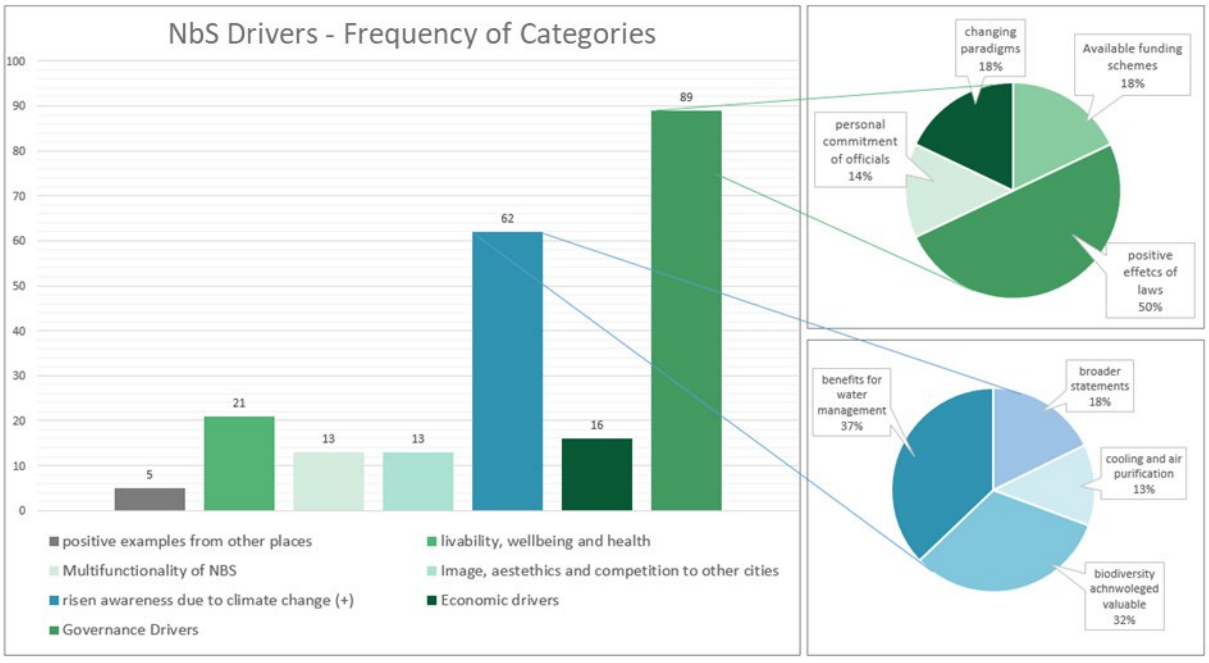

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Figure 12. Frequency of NbS drivers emerged from the interviews

The two most mentioned categories were ‘raised awareness due to climate change’ and ‘governance drivers’, each with three subcategories. In addition, ‘investment drivers’ were also frequently cited.

Governance drivers

Governance drivers (Figure 13) were explained as governance factors that intentionally or unintentionally support the investment and implementation of NbS. While the EU’s guidance and funding were recognized as significant drivers, the importance of national governments acknowledging and supporting NbS was also underscored.

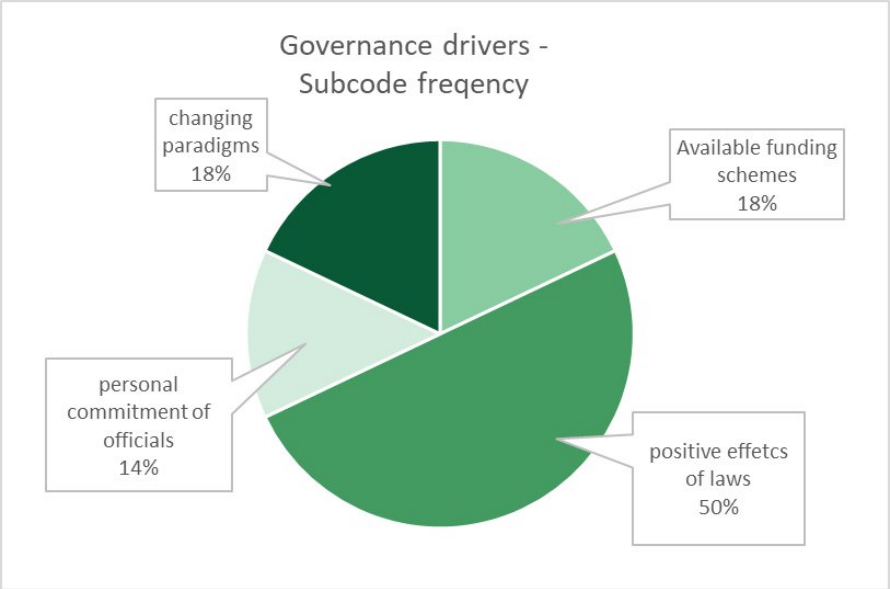

Figure 13. Governance drivers - Sub-code frequency

Available funding schemes

Next to European funding schemes, specific programs cited include France Relance, nature in the city funding (France), the Climate Forest Fund (Denmark), and Section 106 funding (UK), which aim to mitigate the impacts of development and often support projects focused on green spaces and water management.

Some interviewees noted that funding programs can be overly complex, making their requirements difficult to meet and their applications challenging to prepare. According to the interviews, the most effective funding schemes driving NbS investment are found at the local or regional level.

In addition to public funding, there are increasing opportunities for public-private partnerships. Upcoming EU regulations, such as the EU Taxonomy and Corporate Sustainability Reporting Directive (CSRD), are expected to boost private sector interest in investing in NbS or collaborating with the public sector. One interviewee mentioned compensating companies investing in public NbS projects with carbon certificates as a compelling example of public-private partnership. Additionally, partnerships with insurance companies could be promising for cost saving, particularly in healthcare or flood protection. In mountainous regions, where snow and mud avalanches or erosion present significant risks, this approach holds considerable yet underutilized potential for NbS financing.

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Livability, wellbeing and health

An important argument for NbS investments, especially for cities, is the improved livability as a result of NbS measures. In line with the literature, respondents cited benefits such as well-being, recreational value and quality of life as key drivers for investment. Additionally, the actual effects on mental and physical health received less attention but were nevertheless mentioned. The positive impact of NbS investments on quality of life and well-being is a key argument for gaining public support and facilitating investment in such projects. In dense urban areas, there is a significant demand for green spaces among residents. This demand also has an economic dimension, influencing a city's image, real estate values, and the economic value of local recreation areas.

Multifunctionality of NBS

The multifunctionality of NbS is an important point when it comes to NbS investment. Because of the many positive effects of NbS, nearly any NbS intervention is, by definition, multifunctional. These synergies that have great potential to convince decision-makers to invest in NbS instead of other (grey) solutions. With limited capacities regarding space, budget and staff, NbS offer the advantage of tackling several obstacles at once. From a political standpoint, NbS projects can align with and support various sustainability agendas at the same time.

Economic drivers

The previous chapters have highlighted the numerous benefits of NbS and explained why public institutions choose to invest in them. While some have suggested that public sector investments may prioritize non-financial aspects over monetary considerations, it is important to also explore the economic arguments for investing in NbS from the respondents' perspectives. These economic considerations are often linked to other benefits. For instance, interviewees observed a clear connection between NbS and improvements in microclimates, quality of life, the image of a city or region, and real estate values.

4.4. CHALLENGES FACED BY THE PUBLIC SECTOR IN RELATION TO NBS INVESTMENT

Figure 14 provides an overview of the various challenges experienced by interview respondents concerning NbS deployment.

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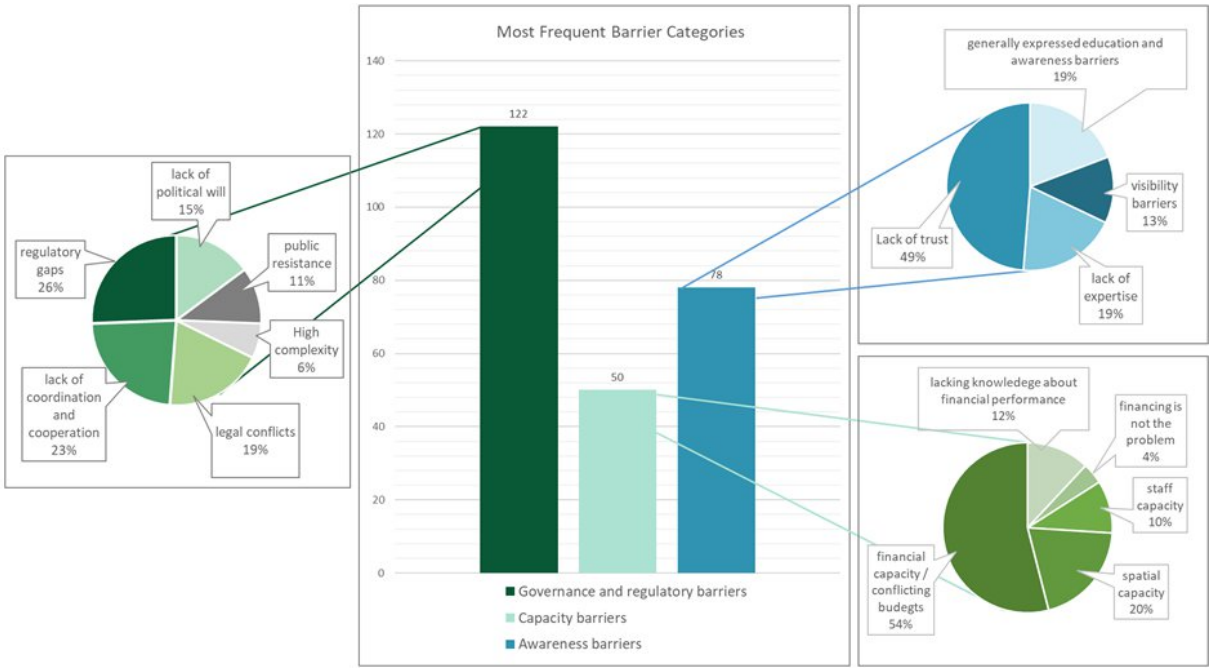

Figure 14. Most frequent barrier categories in the qualitative interviews concerning NbS finance

It is important to clarify that this figure is derived from qualitative experiences rather than a quantitatively rigorous statistical survey. The data presented reflect the frequency with which topics were mentioned during the interviews and the number of times specific text sections were assigned to a particular code.

Capacity Barriers

One of the biggest challenges in financing NbS projects is capacity, particularly financial capacity. Nearly all interviewees cited budgetary constraints as a significant issue, often due to conflicting priorities where public authorities favour other urgent projects over NbS. Additionally, there are concerns about unpredictable maintenance costs in the future, which are typically not covered by existing funds and must be borne by cities themselves, as noted by three interviewees.

The complexity of funding schemes also presents considerable obstacles. Many respondents identified the intricate and time-consuming nature of funding applications for NbS projects as a major barrier, making it difficult to secure financial support. This challenge is exacerbated for small municipalities in rural areas that lack the staff resources to manage such applications effectively. Project and Living Lab partner NIVA further noted a lack of national funding in Norway, with recent cuts to earmarked R&D budgets expected to significantly impact conservation and restoration efforts.

Spatial limitations also pose capacity issues. In dense urban areas and rural areas where most land is owned by farmers, the availability of land for NbS is low, requiring land purchases before project implementation, as five interviewees mentioned.

Competition vs. continuity in granting schemes

NIVA highlighted the competitive nature of subsidy allocation as a relevant challenge. Research institutes and SMEs that secure initial funding often struggle to obtain continued support, which can impede the ongoing development and sustainability of these initiatives.

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However, some public sector interviewees indicated that while financial capacity is a significant barrier, it is not the most pressing issue. They reported that high levels of uncertainty regarding NbS awareness among decision-makers and the general public, as well as governance-related challenges, are also major obstacles.

Regulatory and governance barriers

Across EU countries, there is a notable absence of regulations specifically targeting NbS. Where such regulations do exist, they can significantly enhance NbS investment. However, many current laws pose obstacles to NbS projects. In most countries, the regulatory framework is not tailored to NbS measures, resulting in a legal vacuum that creates uncertainty for investors and decision-makers regarding financing and implementation.

These regulatory gaps are often linked to conflicting laws that fail to recognize NbS as viable solutions for certain challenges. For example, Spanish interviewees noted that groundwater regulations obstructed NbS projects in water management by not allowing plants as effective solutions for cleaning surface water. Similarly, in urban settings, conflicting laws and priorities - such as traffic safety and the protection of underground infrastructure - frequently take precedence over NbS projects. As a result, public institutions often prioritize these competing issues, leading to inadequate financial support or even the discontinuation of NbS initiatives. This prioritization is partly due to conflicting budgets which is further amplified by a lack of cooperation and awareness.

As NbS are implemented at the local level, local governance plays a crucial role in their successful financing and implementation. The local political climate, policy framework, and political will are considered decisive factors by all interviewees, serving as both potential barriers and drivers. In many cases, evolving political paradigms toward sustainability and NbS act as drivers. Conversely, mistrust towards NbS from local politicians and the general public can be a significant barrier. Nonetheless, interviewees found that local governance is generally more proactive in the NbS sector compared to the national level, which they perceive as relatively passive.

Lastly, the integration of NbS into a circular economy was discussed during the interviews. Some stakeholders suggested that NbS projects should be specifically planned and structured from the outset to be circular. This includes considering supply chains, source materials, and adaptability from the design and planning stages. However, an important factor in assessing the circularity of an NbS approach is the long-term impact of these projects, which is often uncertain.

Unexploited synergy potential between departments

Many NbS-related activities necessitate coordination among various departments within a regional authority. Given their multi-functionality, NbS have the potential to address multiple issues simultaneously and offer a way to overcome conflicting budgets through joint financing. However, this essential cooperation is often lacking. Departments may have differing perspectives and interests, favouring grey solutions over green or blue ones, or they may lack confidence in the effectiveness of NbS, as noted by several interviewees. To address these challenges, it would be beneficial to establish a coordinating authority with decision-making and budgetary power to unify departmental efforts and ensure effective collaboration.

Lack of awareness

A significant barrier to NbS financing is the lack of awareness and knowledge among public institution employees, decision-makers, and the general public about the functionality and effectiveness of NbS. This leads to a lack of confidence in NbS effectiveness. Political decision-

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makers often prefer grey solutions, possibly due to low awareness of NbS or a lack of expert knowledge. They seek detailed, quantifiable impacts of investments before releasing financial resources, but often lack this expertise Municipalities interested in investing in NbS struggle to find experts for implementation.

Cultural barriers also play a role. Many stakeholders, including elected representatives and managers, show greater confidence in grey infrastructure over NbS. This cultural reluctance to replace traditional concrete solutions with natural alternatives, combined with concerns about integrating nature into urban environments, presents a significant challenge, as one interviewee noted.

Some interviewees felt that their countries are lagging in NbS awareness compared to others in Europe, particularly in France, Portugal, and Croatia. Austrian interviewees emphasized the importance of public awareness, as public resistance or support is crucial for political investment decisions.

This chapter has highlighted the challenges public institutions face in financing and investing in NbS, showing that, alongside awareness and financial capacity, regulations and governance can act as both enablers and obstacles. However, there is substantial potential for NbS development if drivers and synergies are leveraged to overcome these barriers. The following section will offer policy recommendations to enhance public sector engagement with NbS.

4.5. POLICY RECOMMENDATIONS FOR ENHANCING PUBLIC SECTOR ENGAGEMENT WITH NBS

Table 6 summarizes the policy recommendations derived from the public sector interviews, categorized by governance scale.

Effective cooperation across multiple governance scales is essential for enabling NbS investment and implementation. The interviews revealed a slight deficit of effective measures at the national governance level across countries. Currently, the European Union provides laws, guidance, and funding for NbS financing and implementation, primarily targeting the local scale. Nationally, various laws and existing funding schemes should be leveraged to facilitate a broader rollout and increase financing opportunities for NbS.

One strategy could be to offer tax incentives for companies that invest in public NbS projects in order to foster public-private partnerships. Enhanced cooperation between departments could be achieved by introducing coordinating umbrella management authorities at regional or local levels. This would ensure cross-departmental collaboration and could be further supported by joint financing approaches that require multi-functional projects.

Respondents frequently highlighted the complexity of applying for funding for NbS projects, stressing the need for a simpler application process, particularly for EU and national funding schemes. Funding schemes that directly target NbS could promote cross-sectoral financing for both implementation and maintenance.

To improve awareness, all governance scales should collaborate in providing comprehensive information about the effectiveness, financial performance, and general benefits of NbS. Maintaining or scaling up NbS research funding would help generate knowledge, professional expertise, and increased visibility. Additionally, larger awareness campaigns should be conducted to educate decision-makers and the general public. To address the challenge of

insufficient professional expertise, national governance should facilitate cross-sectoral staff training on NbS to enhance knowledge across various public departments.

Furthermore, the issue of conflicting local laws that hinder NbS implementation requires greater attention. Finally, understanding the long-term impacts of NbS is crucial for integrating them into a circular economy.

<table>
<tr><th></th><th colspan="2">Simplify NbS funding</th><th>Close regulatory gaps</th><th>Foster cross-sectional cooperation</th><th colspan="2">Enhance awareness and visibility of NbS</th></tr>
<tr><td>EU-scale</td><td>Simplify the application and approval process for NbS project funding</td><td rowspan="2">Introduce funds specifically geared towards NbS measures</td><td>Strengthen sustainability laws (with special regard to the building sector)</td><td>Strengthening the concept of the circular economy</td><td colspan="2">Maintain or scale up research funding, as it brings knowledge and attention to decision-makers and the public</td></tr>
<tr><td>National scale</td><td>Simplify the application and approval process for NbS project funding</td><td rowspan="3">Reduce conflicts with older laws/regulations by applying them to NbS</td><td>Introduce tax incentives for companies that support public authorities in NbS projects</td><td>Enable cross-sectional NbS-staff training for employees of public institutions</td><td>Enable large-scale NbS awareness campaigns for policy makers and the public</td></tr>
<tr><td>Regional/ Local scale</td><td>Incentivize cross-sectional cooperation (joint funding)</td><td>Examine possibilities to include the maintenance of NbS in funding schemes</td><td>Enhance attractivity of public-private partnerships (local partnerships, carbon certificates)</td><td colspan="2" rowspan="2">Cooperate with other publicly influential institutions such as local football clubs for NbS awareness campaigns</td></tr>
<tr><td></td><td></td><td>Leverage synergies of NbS by introduce umbrella management authority that brigs various departments and topics together</td></tr>
</table>

Table 6. Policy recommendations form public sector Interviews

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5. INVESTOR COMMUNITY ANALYSIS

5.1. RESPONDENT PROFILE

5.1.1. TYPES OF ENTITIES

Most of the respondents were affiliated with Investment Funds/Asset Managers – 16 in total (40%), 8 (20%) were provided by Banks/Credit Institutions, 5 (12.5%) by Asset Owners /Pension funds/Sovereign Wealth Fund, 4 (10%) by investment functions of insurance companies, 2 were “Other investors” and 5 categorised themselves as none of the above (one of which was self-identified as “crowdfunding”) (See Figure 15).

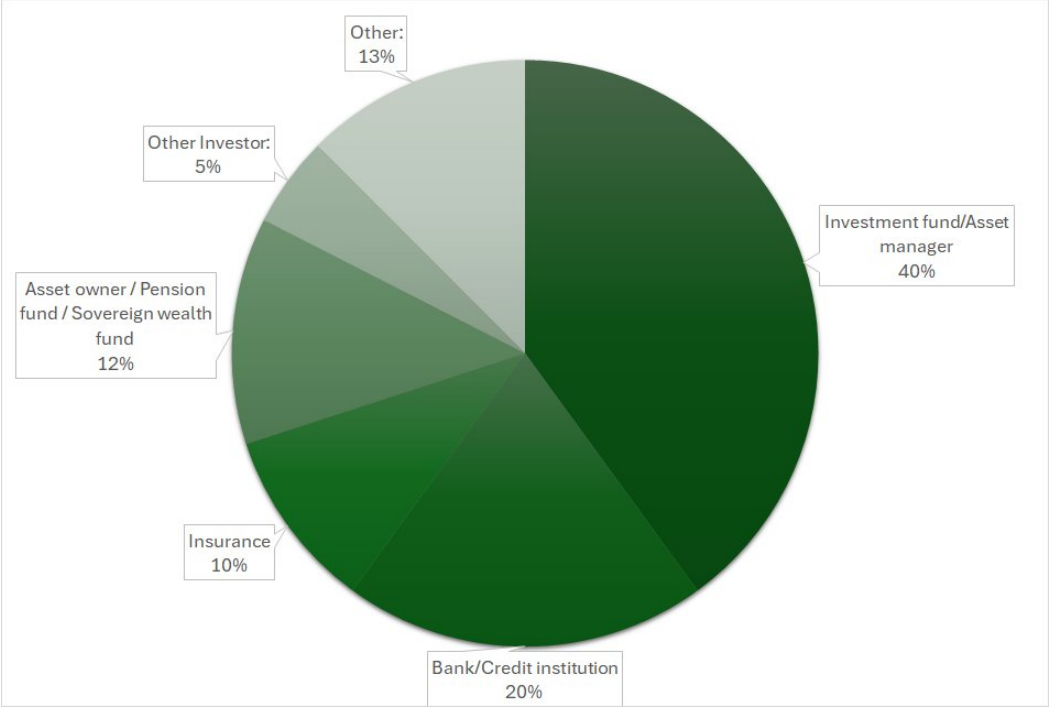

Figure 15. Types of financial services organisations represented in survey responses

5.1.2. GEOGRAPHIC SCOPE

The geographic scope of the respondents’ investment activities was determined by the location of the financing recipients. Capital flows are typically global – a European-based capital provider may finance nature-based solutions anywhere in the world and vice versa. For diversification and risk management purposes, investors often target several geographic regions for their investment activities. In our survey, 24 respondents were active in the European market; 9 were active in Oceania including Australia and New Zealand; 2 each in Africa, South America and Middle East (Figure 16). We note the lack of responses from investors/lenders active in North America and Asia.

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Figure 16. Geographic scope of respondent investing/lending activities

5.1.3. SPECIALISED VS. GENERALISED INVESTING/LENDING

A majority of the respondents (25) indicated, that they provide general financing, meaning they finance a broad range of sectors and thematic. Fifteen indicated that they have a more specialised focus. Those who provided more detail on their focus areas, mentioned: agriculture and food systems, forestry, ocean and marine, energy transition, industrial innovation, material/resource efficiency, energy efficiency and transformation, built environment, infrastructure, climate change, sustainability transitions, natural resources/capital and biodiversity.

A number of these topics directly or indirectly interlink with Nature-based Solutions, which is of interest for this diagnostic task exploring the interest and readiness of investors for NbS.

5.1.4. "GREEN","SUSTAINABLE" OR "IMPACT" VS. GENERAL INVESTING/LENDING

The pool of respondents was equally distributed between self-identified sustainable investors/lenders (21) and general investors/lenders (19) (Figure 17). One respondent elected to not answer this question. This allows us to gain insights on the differences of interest in financing NbS between the different groups.

Interestingly, the number of respondents (29), that report having a sustainable investment/lending strategy is higher than the number of self-identified sustainable investors/lenders. Which means that a share of general financing providers likewise have these strategies and are interested in sustainable investing. However, it is again 21 who signal that they actively offer sustainable financing streams to recipient; albeit these are not always the self-identified green investors/lenders (five sustainable investors/lenders do not actively offer sustainable financing streams to recipients). About a quarter or ten out of 39 report not having sustainable investment/lending strategy or framework.

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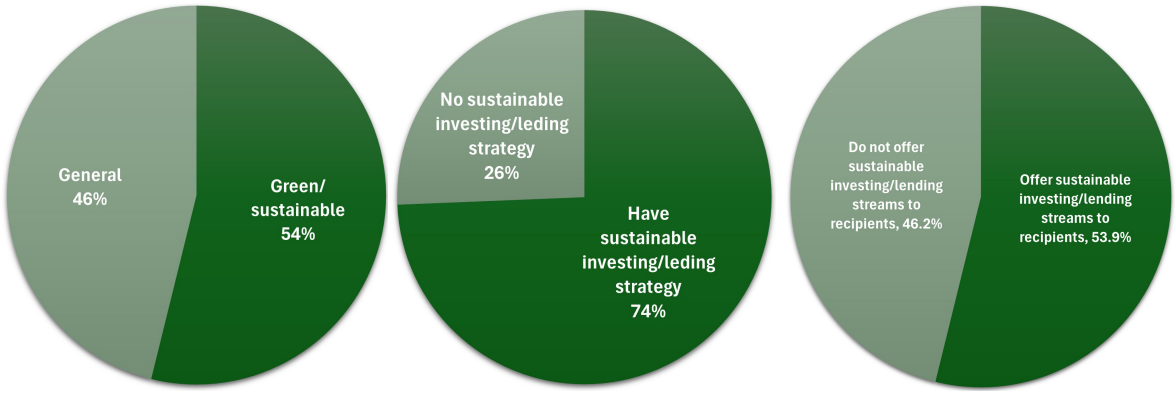

Figure 17. Sustainability focus of respondents: a) self-identified green/sustainable vs. general lenders/investors, b) entities with or without sustainable investing/lending strategies c) entities offering or not offering sustainable investing/lending streams to recipient entities/projects/activities

Those who reported having strategies, were asked which sustainability objectives are included or targeted by the sustainability investment/lending strategy. Climate change mitigation was by far the most popular objective for sustainable financing/lending (22 respondents) with biodiversity benefits and credits a close second (19) with climate change adaptation third (18) and sustainable use of water and resource efficiency sharing a third place (17 each) (Figure 18). Other topics with higher than average popularity among sustainable investor/lenders are pollution prevention and control and circular economy. Less frequently named but present topics include social objectives: diversity and inclusion, better education, better health/healthcare, human rights, poverty reduction. Promotion of peace/conflict reduction was also mentioned by 4 respondents and transition was called out specifically by one respondent (under the "other" category).

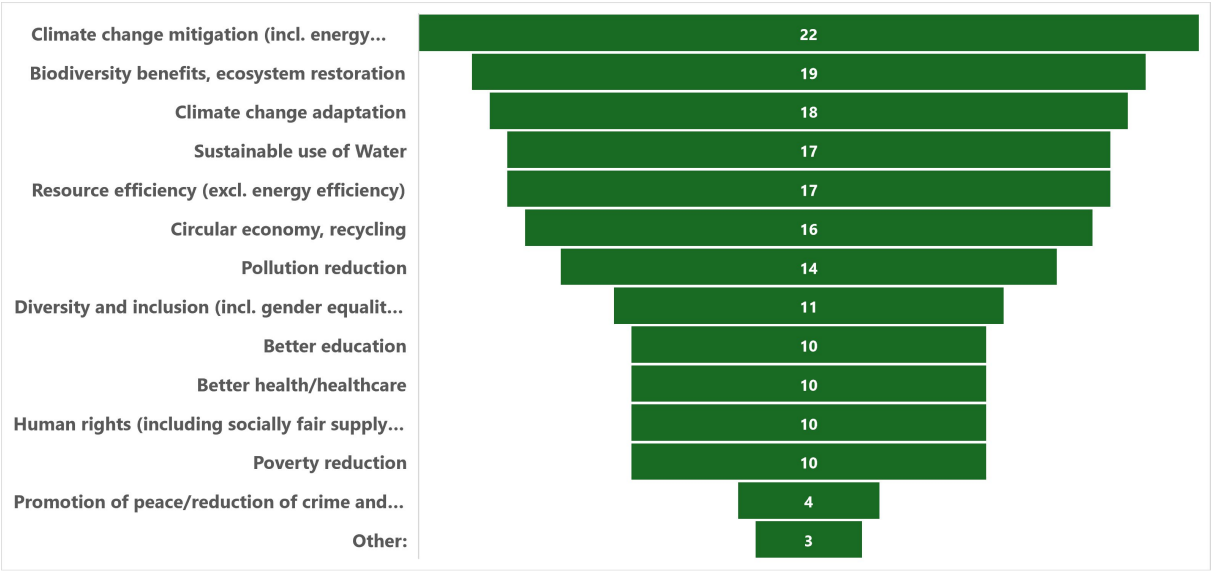

Figure 18. Sustainability objectives targeted by sustainable investing/lending strategies

When asked whether investment/lending for NbS aligns with their sustainable investment/lending strategies and frameworks, 21 of 29 said "yes". It is to note that three respondents chose to respond with neither a "yes" nor "no", but selected "other" as their response, however they did not provide further clarifications.

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5.2. OVERVIEW OF MARKET OPPORTUNITIES FOR THE INVESTORS AND FINANCING INSTITUTIONS

5.2.1. DEFINING "BANKABILITY" AND "INVESTABILITY"

One of the core tasks of the survey was to clarify the in-practice use of the terms "bankability" (a term typically preferred by banks in lending context) and "investability" (a term typically preferred by investors, in the context of various investment instruments) by financial services participants to a) assess whether there is convergence of the determining factors and b) to inform NbS suppliers on the aspects financing providers take into account when determining the opportunity "bankable" or "investable".

Somewhat unexpectedly, slightly less than half of the respondents reported that they use the terms "bankable" or "investable", which indicates low convergence.

56% of investment funds report using the term "investability" and predominantly consider "alignment with sustainable investment goals" and "financial value growth potential" to be the key determining factors, followed by "generation of continued revenue streams" and "achieving sustainability impacts/goals/targets". This outcome is reflective of the respondent profile, most of whom self-identify to be sustainable investors – they place the alignment with and achievement of sustainability goals at an equal footing with the financial value and revenue stream generation. However, it is to be noted that sustainability achievements are not weighed higher than the financial returns by this group, therefore an "investable" NbS project would need to satisfy both aspects. Albeit to a lesser extent, investment funds also pay attention to all other factors included in the survey: "potential for a profitable exit", "high environmental, social and governance (ESG) ratings" and the overall financial health of the recipient.

A similar share (57%) of banks/credit institutions report the use of the term "bankability", however, in contrast give more weight to "overall good financial health and credit history of the recipient" in combination with "achieving sustainability impact/goals/targets". Banks pay lesser attention to the generation of continued revenue streams, and did not consider ESG ratings or exit strategies.

Insurance sector representatives unanimously reported not using the terms and the sole answer from asset owner indicated "financial value growth potential" as the main determinant of "investability".

Other aspects considered part and parcel of "investability" or "bankability" indicated by the respondents in free text fields were "no greenwashing" and credible decarbonisation strategies.

Overall, we see a clear differentiation of the factors determining "investability" or "bankability" among the different capital provider types, and therefore the potential access to differing forms of financing instruments, with investment capital and lent capital providers considering varying factors in their decisions. While lenders focus more on the overall financial health of the receiving entity (in addition to alignment with the sustainable lending strategy), investors are more concerned with financial value growth, revenue generation and profitable exit potential. This may serve as a key decision-making factor for NbS project developer fundraising efforts.

5.2.2. "INVESTABILITY"/"BANKABILITY" POTENTIAL OF NBS

When asked to rate the investability/bankability of NbS on a scale from 0-"non investable/bankable" to 3-"Highly investable/bankable", on average the respondents scored

1.2. This is the closest to scale score 1-“somewhat investable/bankable (in some cases)”. The score was somewhat lower for bank representatives, falling below 1 for asset owners/pension funds, and considerably higher for insurance respondents (2-“reasonably investable (in many cases)”).

None of the 28 respondents answering the question rated NbS as 3-“highly investable/bankable” and 14% considered NbS 0-“non investable/bankable”. Respondents argued that NbS may present timelines/planning periods that are too long, represent higher uncertainty and volatility, insufficient diversification, as well as may inhibit compliance with regulations which primarily focus on the financial profitability of regulated financial institutions (e.g. pension funds). Some pointed out that the bankable NbS cases so far are more theoretical or anecdotal rather than observed and others focused on the issue of revenue streams not being clearly identifiable/ certain or mentioned credibility problems in this nascent field.

Although, the result indicates the limits of NbS investability/bankability, an encouraging 86% of respondents considered NbS somewhat or reasonably investable/bankable, which is where the private sector financing potential for NbS lies. Respondent comments pointed out that it will be the investors with knowledge in the field who will be able to identify the investment potential.

93.3% of investors/lenders that self-identify as “green” or sustainable considered NbS at least somewhat investable, in comparison with 76% of other investors. This clearly demonstrates that the highest potential strategy for NbS fundraising within private sector is among sustainable/impact funds and green lenders with sustainable investing/lending strategies, with some interest also among other capital providers.

5.2.3. IDENTIFYING MOST “INVESTABLE”/”BANKABLE” NBS TYPES

When asked on open ended question on whether they can identify any NbS types that would generally have higher investability/bankability potential, survey respondents called out the following NbS (in the order of most frequently mentioned):

- Agriculture/food related NbS
- Water-related NbS (including coastal)
- Forestry Assets
- Less frequently – Urban NbS

Generic statements on the most investable NbS included “those with clearly identifiable payer/customer”, those backed by governments, supranational, development banks, or those planned and implemented by local governments and regions. A recurring theme in responses was the link of investable/bankable NbS with climate change mitigation, where the nature benefit is rather a significant positive side effect of the core focus on carbon sequestration or GHG offset generation.

This corroborates the literature analysis, which also identified agriculture-related investments as mostly successful and somewhat contrasts literature review findings as regards mixed results for forestry and water-related assets.

This short-list of investable/bankable NbS types largely aligns with the EIB findings reported above on agriculture and forestry NbS having promising investment potential and medium potential for water-related NbS.

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5.3. ANALYSIS OF EXISTING FINANCING INSTRUMENTS AND INCENTIVES FOR FINANCING INSTITUTIONS

5.3.1. MOST SUITABLE FINANCING MECHANISMS/INSTRUMENTS FOR NBS

The investor community surveyed identified the purchasing of green bonds (see definitions box) with use of proceeds invested in nature-based solutions as the most suitable financing mechanism for NbS by a considerable margin (23% of responses) (Figure 19). Early stage equity investments (17.6%) and special purpose loans (16.2%) were likewise considered suitable, with lower number of mentions in favour of mature stage equity investments and general lending loans. A considerable share of respondents (9.5%) indicted private non-for-profit investments/private grants as a suitable instrument.

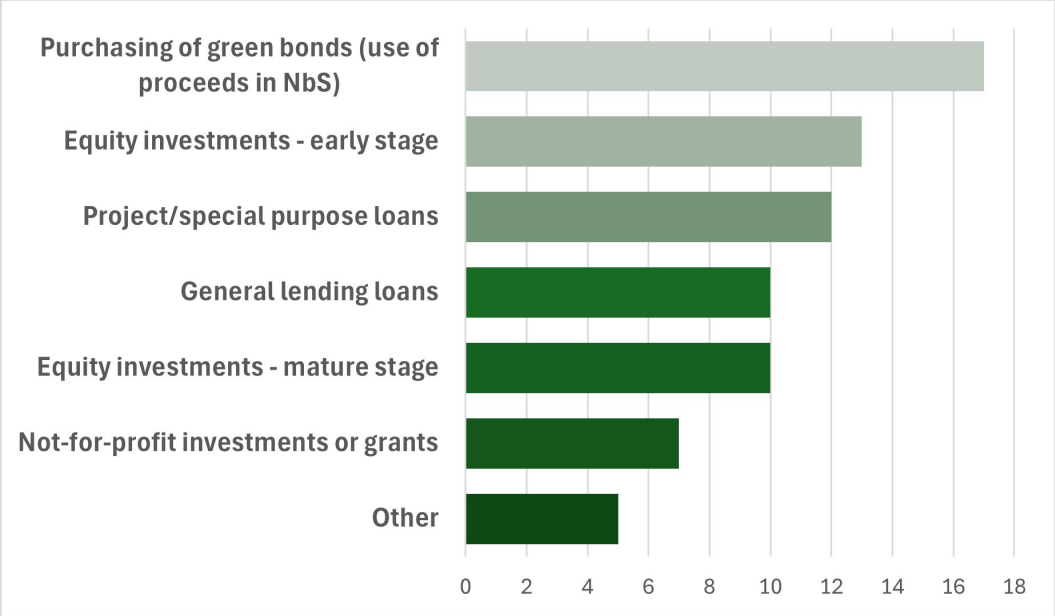

Figure 19. Most suitable financial instruments/mechanisms for NbS financing

Interestingly, these most frequently mentioned instruments represent a range from low-risk (e.g. green bonds) to high-risk (e.g. early stage equity) investment vehicles – potentially illustrative of the different risk appetite levels of the different types of capital providers. Indeed, asset owners (mostly pension funds) represented the more conservative end of the spectrum and strongly prefer green bonds, while fund managers consider the full spectrum of instruments suitable including both more and less “risky” investments. The banks, naturally, emphasise loans as their instrument of choice with equal preference for special-purpose and general lending.

This outcome confirms the pivotal role of green bonds, green special-purpose loans and green start-up funding in taking the NbS investment off the ground. Green bonds especially emerge as a funding mechanism of high interest across the full spectrum of private capital providers – this should serve as in incentive to consider green bond issuance among sovereign, sub-sovereign and potential private issuers active in the field of NbS.

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Box: Definitions of private capital financing mechanisms/instruments

Green bonds: fixed income instruments designed to support specific environmental goals by **allocating proceeds** from the sale of the bonds to projects, which achieve environmental outcomes

Equity investments: investment in company shares leading to co-ownership. **Early stage investments** are in entities, which have developed a business idea and are setting up, but may not yet have substantial revenue. **Mature stage** equity investments target entities with established revenue.

Project/special purpose lending: loans that are issued for a specific purpose, such as to fund a specific project, investment, purchase, renovation etc… (this also includes mortgages)

General lending: loans that are issued to entities without specifying the use of the funds

Not-for-profit investment: private investments, which do not primarily seek financial returns and prioritise environmental or social outcomes/impact. It may include charitable funds, impact investing and similar.

5.4. IDENTIFY FINANCING NEEDS AND CHALLENGES FACED BY INVESTORS AND FINANCING INSTITUTIONS IN RELATION TO NBS

5.4.1. THE MOST SIGNIFICANT BARRIERS HINDERING PRIVATE CAPITAL FLOWS TO NBS

As reported above, European Investment Bank report identified a row of barriers to investment in NbS, which we aimed to test and validate in our survey. We summarised the EIB-identified barriers in a list presented to respondents (Table 7), and asked respondents to rank the severity of the barrier on a 4-point scale, as follows:

	Not a barrier	Somewhat a barrier	Significant barrier	Don't know, can't say
1 Challenges in identifying and assembling relevant information on the performance of nature-based solutions				
2 Gap in knowledge and skills within investor/lender teams				
3 Lack of coordination between various actors, necessary for NbS financing and implementation				
4 High transaction costs				
5 Small/insufficient scale of NbS projects				
6 Long time-frames for implementation (and financial returns)				
7 Inherent uncertain risks/higher risk profile				
8 "The challenge of public goods" – NbS produce a mix of public and private				

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goods and the private benefits alone may not exceed the cost of the project				
9Limited valuation mechanisms/methodologies for NbS				
10 Lack of clear revenue sources				
11 High input costs				
12 Lack of standardised KPIs/metrics for measuring and monitoring NbS performance				
13 High localisation, NbS are hard to scale by replication				
14 Regulations requiring a high level of liquidity of investment				
15 Lack of inclusion of NbS in Sustainable Finance regulations/frameworks				
16 Limited size and financial capacity of the recipient of the financing				
17 Other				

Table 7. Survey excerpt: Ranking of barriers for investment in NbS

Every one of the 16 (plus "other") barriers listed above were rated as "significant" by at least one survey participant. The two barriers rated as "significant" most frequently were:

- Lack of clear revenue sources
- Challenges in identifying and assembling relevant information on the performance of Nature-based Solutions

Followed closely by:

- Gap in knowledge and skills within investor/lender teams
- Small/insufficient scale of NbS projects
- Inherent uncertain risks/higher risk profile
- Limited valuation mechanisms/methodologies for NbS
- Lack of standardised KPIs/metrics for measuring and monitoring NbS performance
- "The challenge of public goods" – NbS produce a mix of public and private goods and the private benefits alone may not exceed the cost of the project

While lack of revenue sources, insufficient scale, risk profile and the "challenge of public goods" are issues that arise due to the inherent characteristics of NbS and may or may not be solvable for the individual NbS types/projects, the other barriers are either data, methodology or knowledge related and are, at least theoretically, solvable.

This high ranking of data and methodology related barriers as particularly significant underscores the importance of research projects like I4N working towards practically applicable tools and knowledge for NbS (projects) understanding and assessments.

Six barriers emerge as most frequently ranked to be "somewhat a barrier":

- Lack of coordination between various actors, necessary for NbS financing and implementation
- Limited size and financial capacity of the recipient of the financing
- Regulations requiring a high level of liquidity of investment

- Long time-frames for implementation (and financial returns)
- High input costs
- Lack of inclusion of NbS in Sustainable Finance regulations/frameworks

Interestingly, regulatory and governance related barriers ranked as somewhat less significant than revenue-related, scale, knowledge, data and methodological issues.

Interestingly, several barriers ranked as “significant barrier” or “somewhat a barrier” are also rated to be “not a barrier” by a fifth of respondents:

- Small/insufficient scale of NbS projects
- Lack of standardised KPIs/metrics for measuring and monitoring NbS performance
- Lack of inclusion of NbS in Sustainable Finance regulations/frameworks

This illustrates the fact that barriers, which are seen as significant by the majority, are not necessarily significant barriers for every investor or lender – there is significant diversity among capital providers. In practical terms, it means that individual conversations with each would be required to determine whether a particular NbS project would be of interest for the investor/lender.

5.5. POLICY RECOMMENDATIONS FOR ENHANCING FINANCING INSTITUTIONS’ SUPPORT FOR NBS

5.5.1. MOST IMPORTANT POLICY SOLUTIONS

The investor survey included an explicit question on the most urgently required policy solutions. Table 8 shows the pre-defined list of potential solutions presented in the survey:

	Not significantly beneficial/ urgent	Somewhat beneficial/ urgent	Significantly beneficial/ urgent	Don’t know, can’t say
1 Inclusion of various types of NbS in sustainable finance Taxonomies (e.g. the EU Taxonomy of Sustainable Economic Activities)				
2 Explicit inclusion of NbS in Green Bond standards (where policy-led)				
3 Inclusion of biodiversity considerations/criteria in ESG Benchmark regulations for indices (e.g. EU Benchmark Regulation)				
4 For countries to set clear climate-related targets and action/transition plans with the role of NbS explained				
5 For countries to set nature-restoration related targets and action/transition plans with the role of NbS explained				
6 Better accommodation of NbS in urban planning/zoning				
7 Introduction of mandated biodiversity impact compensation/offsets				
8 Other				

Table 8. Survey excerpt: Most urgently required policy solutions

The most requested policy-related solutions by the investor/lender community were:

- For countries to set nature-restoration related targets and action/transition plans with the role of NbS explained
- Introduction of mandated biodiversity impact compensation/offsets
- For countries to set clear climate-related targets and action/transition plans with the role of NbS explained
- Explicit inclusion of NbS in Green Bond standards (where policy-led)
- Better accommodation of NbS in urban planning/zoning

Inclusion of various types of NbS in sustainable finance Taxonomies (e.g. the EU Taxonomy of Sustainable Economic Activities) and ESG Benchmark regulations for indices was mostly considered somewhat urgent.

Recommendations

- What emerges from the investor survey results is the need for coordinated action from national to very local levels of policy-making and governance.
- In needs to start from a clear policy commitment to the UN Convention on Biological Diversity (CBD) targets – translating them into national targets with legislated commitments and action plans to provide planning and investment security for the financial market participants. As well as clear linking of national climate-related targets with the role of NbS in their implementation.
- Local level regulations need to be better aligned with the global and national commitments, e.g. the commitments in increasing urban greening, need to be translated into more favourable urban zoning rules.
- Investors and lenders call for mandated rules on biodiversity compensation/offsetting rules where unavoidable damage to nature is done by human activities. This would create a mandatory biodiversity credit/offset market, akin to the carbon credits/offsets. While there are significant ongoing discussions on the credibility and evidence base for the existence and beneficial functioning of such markets, such credits offer clear revenue stream for NbS projects, which may otherwise be deemed “uninvestable” or “non-bankable”. Due to the high number of controversies, any such solution should be implemented with highest caution and consideration of best available evidence, with in-built safeguards against sub-optimal offsetting, low-quality NbS proliferation.
- Sustainable finance taxonomies offer themselves to be a solution that can set NbS quality criteria and safeguards against harms to sustainability objectives when implementing nature-positive NbS in an otherwise non-defined and rarely regulated space. Inclusion of NbS, for example, in the EU Taxonomy for sustainable economic activities would allow NbEs and NbS projects to identify themselves as “taxonomy aligned” thus signalling to investors their suitability as pre-vetted “green investment” easing capital flow and reducing the burden of due diligence for capital providers.
- The private capital providers call for an explicit integration of NbS in Green Bond standards. In the EU, where the EU Green Bond Standard mandates 85% alignment with the EU Taxonomy, this can be achieved by having sufficient coverage of NbS in the Taxonomy (as in the point above).

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6. NATURE-BASED ENTERPRISES ANALYSIS

6.1. CHARACTERISTICS OF THE NBES

For this deliverable, survey findings on NbEs are situated in the context of more general EU data on small and medium-sized enterprises (SME). This data helps to frame NbE findings and identify potential commonalities or differences between the general SME population and NbEs.

Small and medium-sized enterprises (SMEs) in Europe employ almost two-thirds of EU workers and contribute more than half of all value added in the European economy. The EU identifies three types of SMEs: micro-enterprises with 0-9 employees, small enterprises with 10-49 employees, and medium sized enterprises that have between 50 and 249 workers. Large enterprises comprise more than 250 employees. In terms of enterprise numbers, the vast majority of SMEs belong to the smallest size category, with micro-sized enterprises accounting for 22.82 million (94%) of the 24.3 million SMEs in the European Union (McEvoy, 2024).

The EU SME classification also takes into account the amount of turnover of an organisation in which the turnover of a micro-enterprise is €2 million or less, between €2 and €10 million for a small sized enterprise and between €10 and €50 million for medium sized enterprises. In the survey, we asked organisations to identify their size with respect to both numbers of employees and turnover. The results of this question can be seen below in Figure 20.

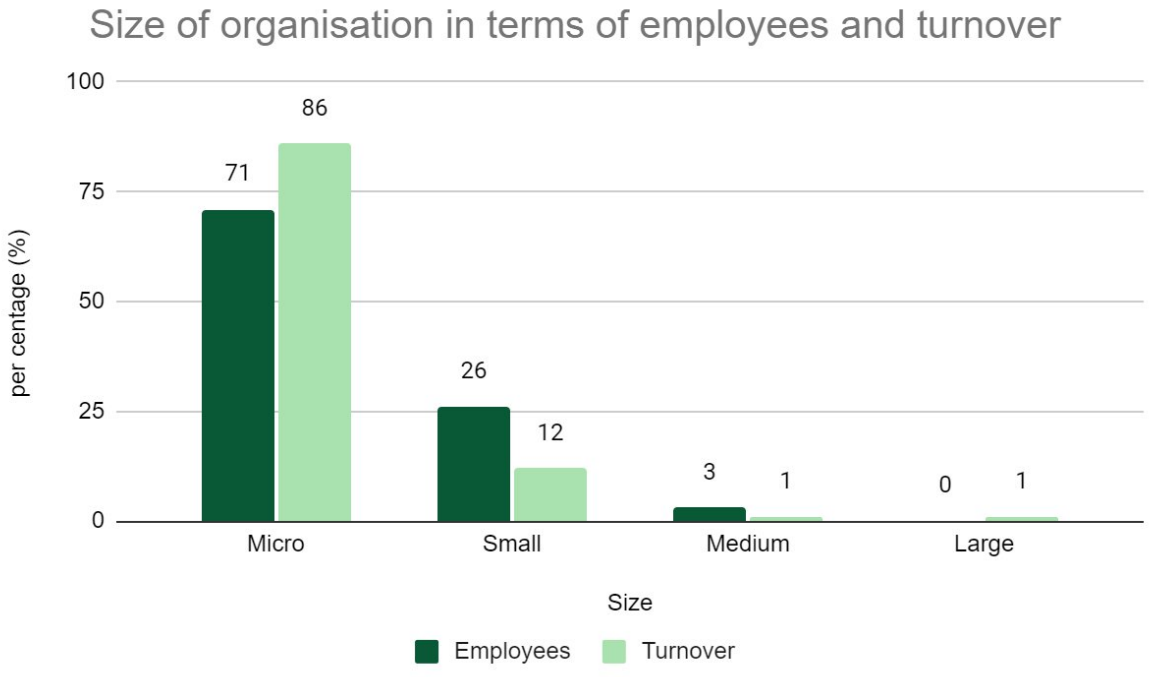

Figure 20. Organization size in terms of employees and turnover

As can be seen in Figure 20, of the 124 NbEs who completed the survey, the majority were micro-enterprises in terms of both employees and turnover.

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Over sixty per cent of the respondent NbEs were established within the last 10 years. Respondents' market orientation varied from local to international, with almost a quarter (24%) stating that they deliver products and/or services at all levels (local/ regional/ national/ international). A further 17% included the international level as a focus, but 59% of respondent NbEs were operating at a national (35%) or sub-national (24%) level. Local markets were the main focus for 15% of respondents.

Survey respondents were asked to indicate if their organisation's main goal was economic, non-economic, or hybrid (Figure 21). The non-economic goals considered were environmental and social. Hybrid was defined as having both economic and non-economic goals. The majority (69%) of NbEs reported hybrid goals balancing economic and non-economic objectives. While environmental goals were again commonly given more weight by these respondents, 81% had both environmental and social goals.

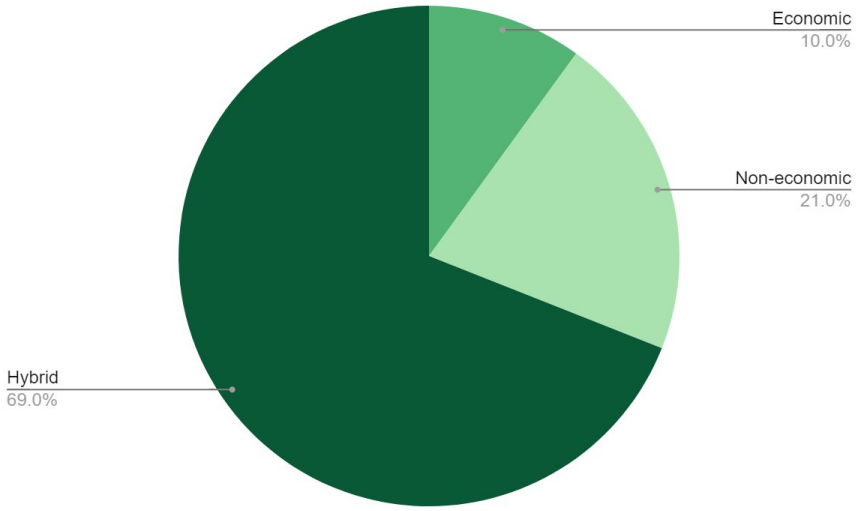

Figure 21. Survey question: what is the main goal of your organisation?

6.2. OVERVIEW OF THE MARKET OPPORTUNITY FOR NBES

Market opportunities for NbEs are linked to market demand and financing of nature-based solutions. UNEP has identified that investment in NbS needs to triple by 2030 and quadruple by 2050 in order to meet government commitments to climate, biodiversity and restoration targets (United Nations Environment Programme, 2023). In Europe, the concept of NbS has already become mainstreamed in policy with the EC leveraging hundreds of millions of euro in the implementation of NbS since 2016 (El Harrak and Lemaitre, 2023). This obviously creates a significant opportunity to mainstream NbEs, and not just NbS, with up to 30 million jobs could be created if the required investment is realised (ILO, UNEP and IUCN, 2022).

UNEP calls for government action to support the development of NbEs, in particular those involving marginalised groups who are often the stewards of nature (United Nations Environment Programme, 2023). The role of NbEs in implementing NbS and creating jobs has been recognised by other international bodies such as the International Labour Organisation (ILO) and IUCN (ILO, UNEP and IUCN, 2022). In their 2022 report, they estimate that around 14.5 million people are already working in NbS, mostly part-time. If the calls to triple financing to meet government targets are realised this could generate a further 16 million jobs (full time equivalents (FTE)). In low to middle-income countries, the majority of such jobs and

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enterprises are in the agriculture and forestry sectors whereas in high-income countries, more jobs are being created in ecosystem restoration and natural resource management. In Europe, the Impact Assessment underpinning the European Restoration Law estimate estimates up to 500,000 additional jobs could be created through Natura 2000, the largest network of protected areas in the world (European Commission, 2022).

In line with this increased mainstreaming and investment in NbS in Europe, Figure 22 details the level of market demand for products and services reported by the 124 NbEs who completed the NbEs survey. The vast majority of respondents reported an increase in demand, with 46% experiencing a strong increase and 43% a slight increase. A small proportion of respondents reported decreased demand, with just over 2% stating there has been a slight decrease and 1% reporting a strong decrease. The remaining respondents (8%) reported no change in demand for their products and services.

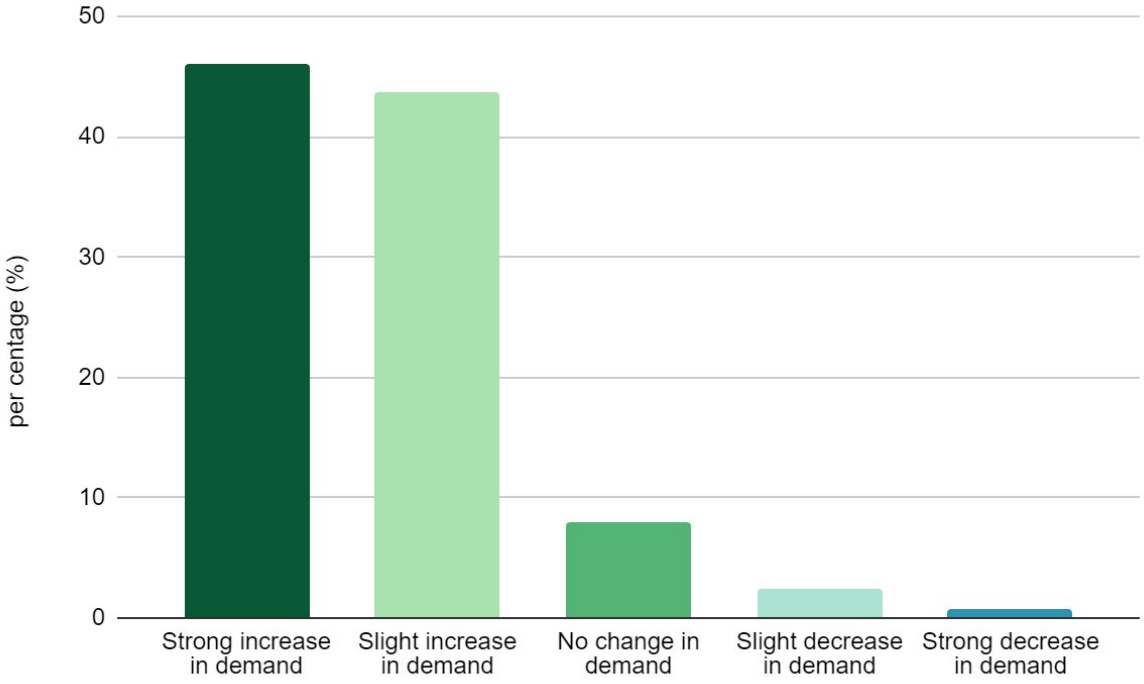

Figure 22. Level of market demand

These findings provide an interesting contrast with perspectives on economic outlook reported by European SMEs as a whole. The 2023 report of the annual European Commission and European Central Bank (ECB) survey on the Access to Finance of Enterprises (SAFE) reported that 46% of SMEs think that the general economic outlook has deteriorated since 2022, with only 7% expressing an improvement and 40% reporting no change. Fewer SMEs (36%) report an increase in turnover in 2023 compared to the three previous years with 37% reporting no change and 26% reporting a decrease. Less than a quarter (22%) of SMEs report rising profits. 73% of SMEs report increasing labour costs and 38% report increased interest expenses. In addition to the rise in production and operational costs, other key challenges include skilled staff shortages (29%) and finding customers (16%). Notwithstanding this negative outlook, 60% expect some growth in turnover in the next couple of years but only 8% expect substantial growth. These findings echo OECD reports on financing SMEs and entrepreneurs from 50 countries up to the end of 2022 (OECD, 2024) which identify challenges from inflation and uncertainty due to broader geopolitical tensions.

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To further explore the reasons behind the perceptions of economic outlook found among NbEs responding to this survey, respondents were provided with free text space to elaborate on any change in the demand for their products and services since they had joined the market, and just over half of respondents provided further information here. The two main themes identified in these responses related to changes in knowledge and awareness regarding climate change and the need for action; and regulatory factors encompassing legislation, reporting & disclosure.

Regarding regulatory factors, respondents noted various reforms in favour of nature. Respondents noted that a rise in demand for their products and services was due in part to the recent introduction of new EU and national laws.

"A growing demand for NbS started last year with the incentive from EU - requiring NbS to receive funds from the recovery plan." (Slovenian NbE in water management sector)

The introduction of regulatory frameworks and the voluntary reporting disclosure agreements such as the Taskforce on Nature-related Financial Disclosures (TNFD) and the Science Based Targets Network (SBTN) have had an impact on the demand for NbEs products and services, as reported by survey respondents. In a European context, while TNFD and SBTN are primarily voluntary in nature, they are informing development of the Corporate Sustainability Reporting Directive (CSRD), which is a new mandatory reporting scheme for most large companies. Another example, cited by respondents, is the incorporation of nature-based approaches to development, such as Biodiversity Net Gain (BNG) and Sustainable Drainage (SUDs), into national policies. This was reported to have had a positive impact on the take-up of NbE products and services.

"The application of SUDS and NbS begins to be mandatory at national and international level" (Spanish NbE in water management sector)

However, legislative and institutional factors were also seen to be under-developed in some countries.

"Increase in interest but lack of frame(works) within legislation, practice and economy (who is going to pay?)" (Danish NbE in water management sector)

The general awareness and acceptance of the need to take action on climate change and the role NbS has in that, both on a public and private level, was also a recurring factor in the level of market demand for NbEs' products and services.

In describing the increase in knowledge and awareness on climate change, one respondent mentioned:

"Ten years ago, there was not so much focus on donating to afforestation, but the dry summer of 2018, as well as an increasing international focus on climate change and how to combat it, has created an increasing focus and demand among private individuals and companies for the opportunity to contribute to afforestation." (Danish NbE in forestry sector)

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6.3. ANALYSIS OF EXISTING FINANCING INSTRUMENTS AND INCENTIVES FOR NBES

The literature review conducted on financing of NbS in Task 3.3 did not specifically consider financing instruments and incentives related to NbEs. Given that the concept of NbEs is emergent, identifying relevant literature to NbE financing presents methodological challenges and is therefore the subject of an ongoing literature review expected to be completed for Deliverable 3.4. For this deliverable, survey findings on NbE financing are situated in the context of more general data on financing of small and medium-sized enterprises drawn from the annual SAFE survey[3]. This framing helps to draw out commonalities and differences between financing of SMEs in general and survey findings in relation to financing of NbEs.

The 2023 SAFE survey report (European Commission, 2023) reports that in total 82% of SMEs use some kind of debt financing in their business. Findings show that leasing or hire purchase of equipment is the most common form of financing, closely followed by various forms of bank financing from loans to other types such as credit lines, overdrafts or credit cards. Despite the increasing cost of financing, this report finds a decrease in 2023 in grants or subsidised loans (38%) from 2020-2022 while financing via trade credit is found to be increasing. The use of equity financing is low at 10% as is factoring 9%.

This survey data further analyses financing by the size of the company and other factors such as the business sector. For example, in relation to bank financing, data shows that the larger a company is, the more likely it is to use this type of financing. Further, there is a wide variation across business sectors with industrial companies more likely to use institutional financing than service/consultancy companies are.

Findings relating to grants/subsidies were inconclusive in relation to size but use of grants/subsidies was more common in industry rather than service sectors.

Aside from debt financing, 30% of SMEs reported retained earnings or sale of assets as a relevant source of financing. The use of retained earnings was significantly more common in larger rather than smaller companies. It was also more commonly found in industrial rather than service companies.

Findings on the use of equity financing were inconclusive in relation to size or industry sector. However, in general, SAFE survey findings since 2016, report that equity investment is consistently less popular than other forms of financing with the proportion of respondents using this form of financing remaining static around 6%.

Figure 23 below illustrates the different types of financing used by NbE survey respondents at different stages of development. The respondents could choose multiple sources of finances across each of the stages. The options of finance to choose from were grouped in the following headings - Personal, Public, Institutional, Private and Profit. 116 respondents answered this question.

[3] More information of SAFE survey https://single-market-economy.ec.europa.eu/access-finance/data-and-surveys-safe_en

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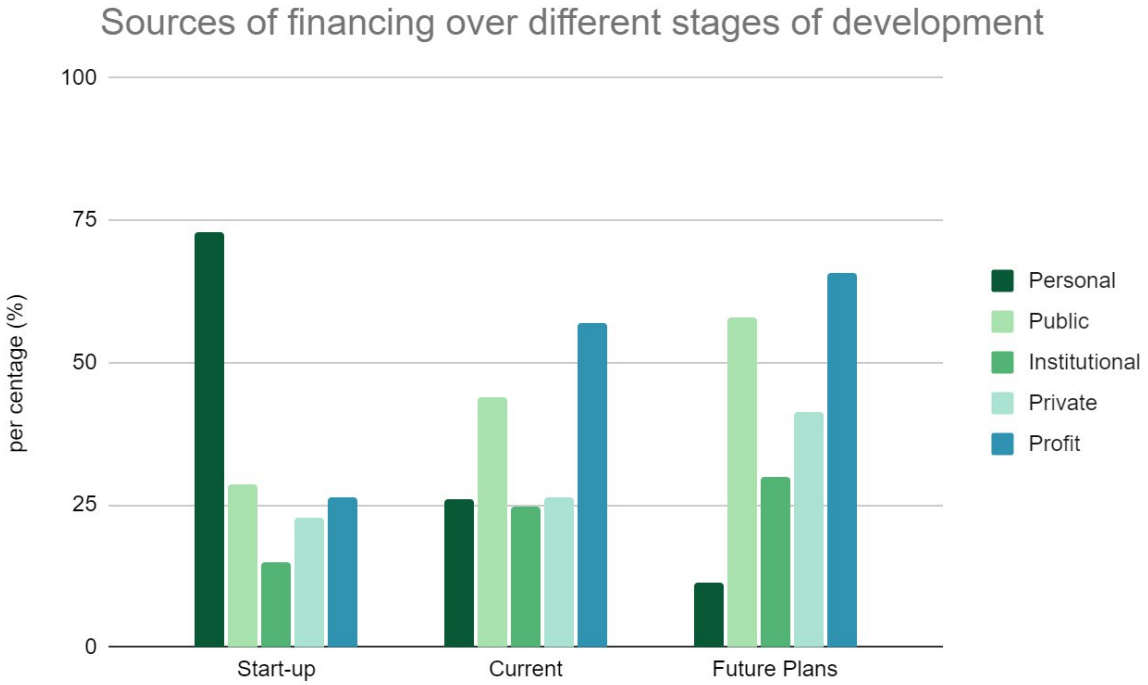

Figure 23. Distribution of finance sources across stages for NbEs

Beginning with 'Personal' financing, in this context this type of financing refers to using personal savings and/or family, 'fools' and friends (FFF) to fund the enterprise. Figure 23 illustrates that personal finance is an important method of financing NbEs during their start-up phase and the form of financing that decreased the most throughout the three stages, leaving it as the least common form of financing in the future plans of NbEs. Regarding personal finance, respondents' comments confirmed that this type of financing was an important source of finance to kick-start a business venture noting that bootstrapping[4] and personal money were used to start their NbE:

"Personal liquidity to start and private investors to grow the business" (Swedish NbE in the urban sector)

The next type of financing shown in Figure 23 is public finance, referring to grants/funding received from local, regional, national or EU sources. Use or future use of this type of financing increased across all three phases from start-up to future plans. It was the second most utilised form of financing across all stages. In terms of public financing used, some respondents mentioned that public financing was particularly helpful for research and innovation and work to achieve impact:

"We have also extensively utilised European Union grants for the restoration of traditional hay meadows and investments in livestock and equipment." (Estonian NbE in the agricultural sector)

The third type of financing shown in Figure 23 is institutional financing which relates to sources such as, and not limited to, banks or other financial organisations in the form of debt finance, micro-loans. As can be seen from Figure 23, use of this source of finance was low in general

[4] Financial 'Bootstrapping' was described by Bhidé (1992) as "launching ventures with modest personal funds"

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(less than 30% across all three stages of NbE development). Although use of institutional financing did increase over time, increasing demand was modest compared to other sources of finance over the three stages. Although not directly comparable, SAFE survey results show much higher usage of bank financing (loans, credit lines etc...) among the general SME population.

"Today, we utilize free cash flow and bank loans for investments. However, it must be acknowledged that none of the loans have had a "green" or ecological label so far - meaning, the bank loans obtained have simply been secured by land or assets" (Estonian NbE in the agricultural sector)

Private sector financing shown in Figure 23 refers to funding secured from sources such as impact investors and angel investors. It can be seen that private financing showed a slight increase between start-up and current stages, and is identified as the third most prospectively utilised form of financing in future plans. In elaborating on private sector finance, respondents mentioned that it is something they are seeking with differing levels of success.

"I was lucky enough to be introduced to a private investor who was very interested in my designs. We have since formed a business together" (UK NbE in the urban sector)

Finally, financing from profits, as shown in Figure 23 refers to reinvestment of profits generated from products or services back into the enterprise. It is the form of financing that shows the greatest increase from start-up to future plans, and is the most utilised form of current financing methods for respondents.

6.4. FINANCING NEEDS AND CHALLENGES FACED BY NBES

Findings from the SAFE survey conclude that the general SME population in Europe continues to face a challenging operating environment in 2023 characterised by staff shortages combined with a rise in interest rates and the related cost of borrowing. Access to debt financing does not appear to be a problem however, with 82% of SMEs using some form of debt financing and overall survey findings suggesting a moderately favourable lending environment. In other words, SMEs seeking financing, such as bank loans or credit lines, are likely to be successful. As shown in Figure 24, the overall number of SMEs who perceive no obstacles to securing financing has actually increased in the last two years. Only a small number of other factors are raised as challenges to financing. In general, the OECD reports that SME finance policies responded rapidly to changes in the broader environment, introducing buffer measures to mitigate against negative impacts (OECD, 2024).

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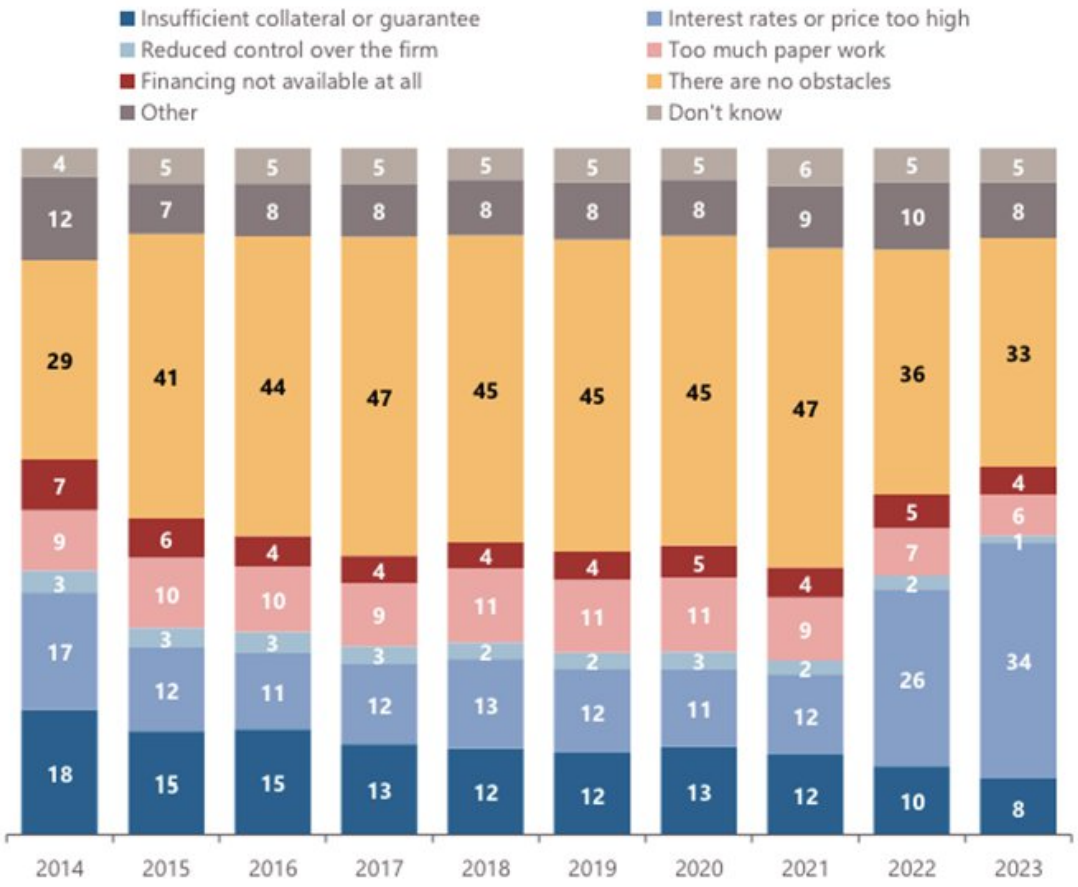

Figure 24. Obstacle to accessing financing (source: SAFE survey (2023) pp 91)

SAFE survey data also shows that the average amount of financing requested by the general SME population has remained fairly stable over the last 10 years and is fairly well spread across different financing amounts. The relatively low number of SMEs seeking financing over €1m (14%) may explain in part why there is a lack of interest/alignment with equity investment.

Contrasting with Figure 24 relating to the overall SME population, findings from this NbE survey show that financing presents more of a challenge to NbEs.

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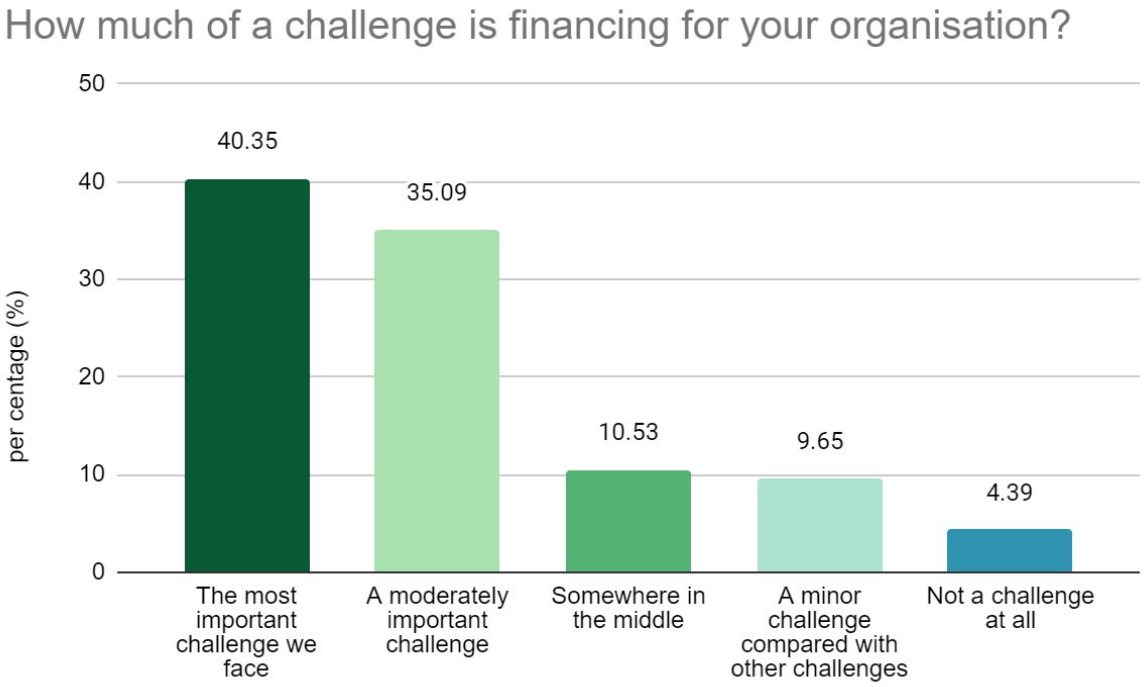

Figure 25. How much of a challenge is financing for NbEs?

Figure 25 from the NbE survey suggests that financing presents more of a challenge to NbEs. However, as NbEs were not asked in the NbE survey to compare financial challenges with other challenges (as in Figure 24), it is difficult to context to make direct comparisons between SAFE survey data and NbE survey data

As shown in Figure 25, 115 respondents answered this question and of those 75.7% stated that financing of their organisation is a challenge with 39.1% of respondents categorising it as the 'most important challenge we face' and 36.5% as a 'moderately important challenge'. 10.4% ranked financing 'somewhere in the middle' of their challenges, 9.6% ranked it is a 'minor challenge compared to other challenges' and 4.4% stated that it is 'not a challenge at all'.

While there is limited literature on the barriers to NbE financing, one previous study from 2021 reported a range of barriers faced by NbEs including a lack of financing of NbS in general, reliance on public sector financing and a lack of alignment with investor interests (McQuaid et al., 2021). Some of these issues crop up again in this study but others emerge too, as described earlier.

To gain more knowledge on the challenge of financing for NbEs respondents were asked to provide information on barriers to financing, both internal and external to their organisation.

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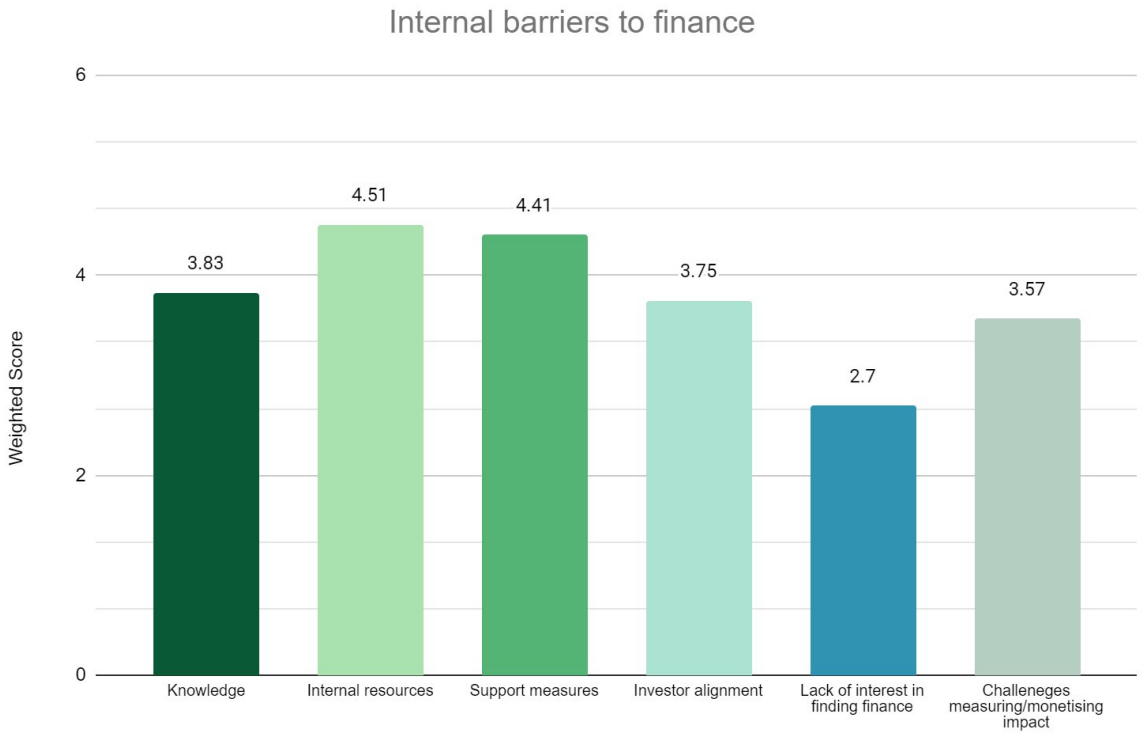

Figure 26. Internal barriers to financing

Figure 26 shows that internal resources are the most significant barrier to financing for NbEs i.e. a lack of time or staff capacity to explore financing options.

With regard to the lack of alignment between private investors and NbEs, some respondents provided additional comments:

"Funders don't really understand nature and want to treat it like any other asset class. Need alternative measures and assessments." (UK NbE in the forestry sector)

Overall, the disparity/difference between internal barriers is marginal. With the exception of lack of interest in finding finance, all other barriers are relatively highly rated suggesting that these barriers are relevant for NbE respondents.

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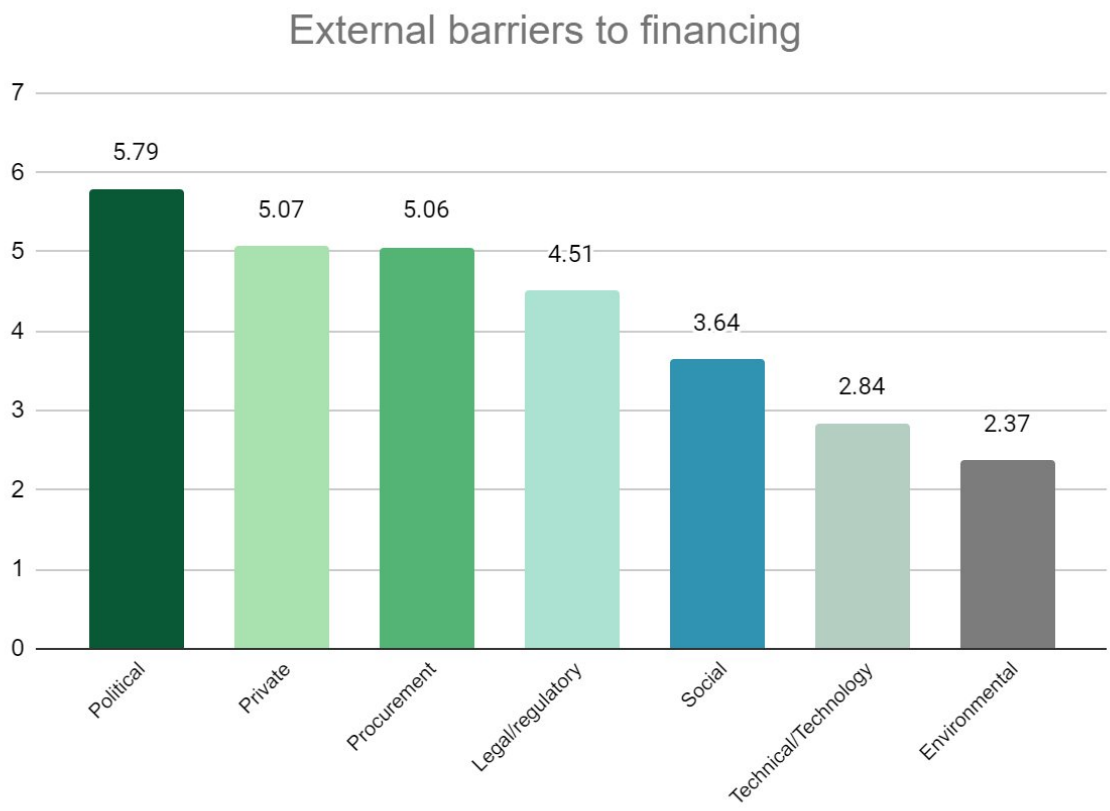

Figure 27. External barriers to financing (n=115 responses)

With regard to external barriers to financing, respondents were asked to rank the following barriers, Political, Private, Procurement, Legal/Regulatory, Social, Technical/Technology, Environmental, in order from 'the biggest barrier' to 'not a barrier to finance'. **Fehler! Verweisquelle konnte nicht gefunden werden.**Figure 27 shows a more clear distinction between the importance of different external barriers.

6.4.1. SPECIFIC CHALLENGES TO PRIVATE SECTOR INVESTMENT

Given the I4N goal of increasing private sector investment in NbS, NbE survey respondents were given the option of elaborating on barriers to private sector financing.

While responses varied, one distinct theme that cropped up was the misalignment of NbE and investor interests/compatibility:

"The desire for returns on investment is incompatible with our aims and objectives." (UK NbE in the forestry sector)

"I have had 3 business angels but it was quite a challenge. Their lack of knowledge and understanding for the field of NbS created large challenges and forced us to have too much focus on short term revenue instead of a long term sustainable strategy and a nature-positive and circular business model." (Danish NbE in the water management sector)

Lack of investors' knowledge about nature and NbS was another theme, potentially feeding into the lack of compatibility between investor and NbE's missions.

"Lack of contact, difficulty in establishing relationships and the commercial nature of potential interested parties." (Polish NbE in the urban sector)

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One respondent also expressed their disinterest in using private sector financing, as the current set-up/traditional ways of this form of financing would negatively affect NbEs independence and ability to develop and innovate in the way they would like/in a way that creates positive impact for nature/biodiversity.

"It would put restraints on our development and innovation as well as it might put us in the wrong direction on focusing too much on creating monetary return of investments." (Swedish NbE in the coastal sector)

Although, NbEs did express interest in future financing from private investors, they are careful about partnering with the right investor.

"Would need to be the right kind of partner, someone who is not going to change the values and mission of the company." (UK NbE in the forestry sector)

6.5. CASE STUDY

Illustrative case study material drawn from our combined interview and survey data to provide examples of the issues covered in 6.1 to 6.3.

6.5.1. NBE CASE STUDY

Seaweeds are low-trophic organisms that require only the sun and the nutrients already present in the water around them to grow. Seaweed farming delivers multiple socio-economic and environmental benefits. Often located in remote rural areas, seaweed farming provides important employment and skills in a nature-positive industry sector. Environmental benefits include mitigating issues associated with excess nutrients originating from other sources. The consumption of seaweed as a food product provides many health benefits and research projects are showing multiple other functions from fertilizers to food packaging.

This case study looks at the forms of financing used at different stages of development of a seaweed farming NbE in Norway. Established in 2016, this coastal NbE aims to produce seaweed in line with nature's principles and to develop products that are healthy for people and the planet. Their initial business model was to make food products from seaweed that required a minimal amount of processing and would create value relatively fast.

Although this NbE benefited from minimal costs in terms of inputs, especially relative to terrestrial agriculture, other challenges emerged in business development. This NbE found that the market was at a very early stage of development for their seaweed product and they had to invest considerable time and resources in creating market awareness and building market demand, as well as invest considerable time, labour and financial resources in product development and research. They faced difficult choices in terms of business development and financing.

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Financing for an NbE in the coastal sector

1. Two distinct paths to increase profitability and sustain the business were identified
    a. **Scale:** Make operations more effective and efficient through scaling up production;
    b. **Quality:** Focus on the quality of the product through collaborative development with customers, with an emphasis on environmental and social benefits
2. The 'Quality' path was chosen. Given the early stage of market development, scaling was considered too risky. The 'Quality' route helps to address the high levels of unknowns in the market that could be answered through communication with customers regarding the product. The company was successful in seeking finance from private investors at this stage of their journey. However, difficulties arose when the company realised that investors expected a return on investment incompatible with the companies' social and environmental goals.
3. New sources of financing were then explored that valued environmental and social aspects on par with making a profit.

6.6. POLICY RECOMMENDATIONS FOR ENHANCING NBES ACCESS TO FINANCING AND INCENTIVES

6.6.1. POLICY RECOMMENDATIONS RELATING TO MARKET OPPORTUNITIES

This research shows that NbEs have different characteristics to the average EU SME. NbEs are also experiencing strong market demand and optimism in comparison with average SMEs. Economic policy makers may not be aware of these differences and how best to support NbEs to scale for higher socio-economic and environmental impact.

Recommendation

The results from this research can contribute in later stages of project development to concerted efforts to inform policy makers about the specific characteristics and needs of NbEs. While NbEs are recognised at EU/international level, they need to be better recognised at national and regional policy level. At all policy levels, further research needs to be undertaken to examine the alignment of existing economic policies and instruments/supports with the specific needs of NbEs and the potential of this sector. For example, how can the EU Sustainable Finance Taxonomy recognize nature-positive NbE activities. Based on new research knowledge, new or adapted instruments better suited to NbE needs could be piloted.

6.6.2. RECOMMENDATIONS FOR NBE FINANCING

This research shows that NbEs (like NbS) are more likely to rely on concessional financing (grants) than conventional SMEs. They are less likely to use institutional financing which is the 'go to' source of financing for most EU SMEs. While this study helps to provide insights on the reasons why impact investment is not attractive to NbEs, further research is needed to

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understand why institutional financing (bank loans/credits) are less attractive. Our research suggests that due to the small size of the NbE and lack of internal resources, they have a lack of awareness and expertise on the full range of financing options and perhaps are unaware of new financing options oriented towards 'Green Deal' sustainable financing businesses. Equally, NbEs may lack the business acumen to make a business case for bank financing.

Similarly, as NbE and NbS are emergent concepts, banks may be unaware of the increasing attractiveness of this industry sector.

Recommendation

The results from this research can contribute in later stages of project development to concerted efforts to inform banks and other investors about the characteristics and needs of NbEs, as well as capacity building for NbEs on accessing different financing options. Further research and pilots of financial instruments targeted towards NbEs may be required.

This research also shows that while low, NbEs are more interested in private equity investment than the average SME. Further stakeholder engagement is recommended involving multi-stakeholder consultations engaging investors and NbEs at an equal level to explore barriers and opportunities for increased impact investment.

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7. CONCLUSIONS

SUMMARY OF KEY FINDINGS

This chapter synthesizes the key findings of the study on financing NbS and provides a comprehensive overview of stakeholder perspectives, future financing implications, and policy recommendations. The conclusions drawn here are based on extensive research and interviews with public sector representatives, investors, and NbEs. This synthesis aims to highlight the challenges, opportunities, and strategic directions for enhancing NbS investments. The chapter concludes with recommendations for integrating these findings into the I4N project and other EU initiatives, emphasizing their contribution to the development of new EC expert publications and capacity-building efforts.

7.1. STAKEHOLDER PERSPECTIVE AND NEEDS ON NBS FINANCING

7.1.1. PUBLIC SECTOR

The public sector faces several challenges in increasing investments in NbS. Interviewees highlighted that financial resources, while important, are not the primary obstacle. Instead, governance issues, cooperation among different departments, and awareness raising are seen as crucial areas needing improvement. There is often a lack of appropriate support measures at the national level, and existing funding programs are frequently perceived as too complex, making them difficult to access, especially for small municipalities with limited staff capacity.

The uncertainty about NbS effectiveness and a preference for traditional grey infrastructure solutions persist among decision-makers and the public. This lack of awareness and expertise hinders confidence in NbS and leads to a reluctance to invest in such projects. Moreover, regulatory gaps and conflicting laws further complicate the implementation of NbS, creating a legal vacuum that deters investment.

The public sector also struggles with budget conflicts and unpredictable maintenance costs, which are not typically covered by funds, adding another layer of complexity to financing NbS projects. Additionally, the competition-based nature of granting schemes can impede the continuity of conservation and restoration efforts, particularly for research institutes and SMEs reliant on short-term funding.

To overcome these barriers, there is a need for greater cooperation between departments to exploit the multifunctional benefits of NbS and joint financing opportunities. Enhancing the expertise and awareness of decision-makers and the public about the effectiveness of NbS is crucial. Moreover, establishing clear and supportive regulations specifically tailored to NbS can provide the needed confidence and legal framework to boost investments.

7.1.2. INVESTOR COMMUNITY

As gleaned from our investor community diagnostic survey, financial services entities, especially those that identify as green or sustainable lenders/investors and have sustainable lending/investing strategies in place, are interested in NbS-related opportunities, albeit do not pursue them at scale yet.

On average, the investor community considers NbS somewhat investable/bankable, and an encouraging 86% consider NbS reasonably investable/bankable. The general view is that NbS are not “highly bankable/investable”, however certain types of NbS-related investments, namely agriculture/food-related NbS, water-related NbS, forestry assets, and urban NbS were identified as having a higher potential.

Key findings indicate that while there is no uniform consensus on the terms “bankability” and “investability” for NbS among private capital providers, and many do not use these terms at all, close alignment with sustainable investment goals (credible achievement of nature-related or other sustainability targets) and potential for financial value growth as well as overall financial health of the recipients are critical factors determining whether an NbS project or NbE will be seen as a viable recipient of the funds.

The most critical barriers impeding NbS investment are the challenges in accessing relevant sustainability and financial performance information, lack of clearly identifiable and reliable revenue sources for NbS, significant knowledge gaps within investor/lender teams, high transaction costs, higher risk profiles and “public goods issue” as well as limited availability or know-how on valuation methodologies for NbS.

Some of these issues may not be easily solvable – such as the inherently limited range of direct revenue streams of NbS and the public good issue, higher risk profiles and long periods of returns as well as the need for more time investment on the lender/investor side to understand, assess and monitor the investment opportunity. However, others – namely those relating to data availability, methodology and tool development as well as policy and governance related - are addressable through coordinated actions, including research and tool development, such as the work undertaken within I4N toolbox development.

Policy solutions most frequently seen as “urgently required” by respondents included nature-restoration targets on national policy levels, lining of NbS to climate-related targets and actions, introduction of biodiversity impact compensation/offset schemes, better accommodation of NbS in urban/spatial planning, as well as inclusion on NbS activities in sustainable finance taxonomies, green bond standards and ESG Benchmark regulations.

7.1.3. NBES

The financing of NbS is inextricably linked with the success and scaling of NbEs considering they are designers, implementers and stewards of them. Considering the results of the survey used for this report as well as the SAFE survey used as a comparison, many things can be deduced regarding NbEs perspectives on financing for themselves as well as for NbS in general, including opportunities and barriers.

Firstly, there seems to be a consensus among NbEs that the demand for NbS is growing, which in itself is an investment opportunity for investors, especially considering the reported slow down in economic activity for general SMEs. In saying this, many challenges need to be addressed in order to utilise a diverse range of financing options in order to leverage the beneficial potential of NbEs and NbS. NbEs envision using multiple sources of financing in order to grow and scale, most notable profits, grant funding and private investments.

Private financing offers opportunities for NbEs and NbS and is being discussed and explored in many circles, including that of the I4N project. However, NbEs have conveyed many barriers to private financing for them. For instance, NbEs highlighted the difference in goals between NbEs and private investors in that private investors don’t value the positive outcomes of NbEs and NbS for nature and thereby don’t have sufficient mechanisms or willingness to invest in

this. Connected to this is the lack of a return on investment that NbEs are currently able to provide and that most private investors require. In this, there is a need for a new and novel way of approaching private investment in this unique context that matches the capabilities of NbEs. This is ever more important considering NbEs expressed optimism in sourcing private financing going forward.

NbEs also showcased an interest in grant funding at a level higher than the average SME. While there is much currently going on in this space related to NbS, more needs to be done to alleviate the bureaucracy, and time and labour demands that it puts in NbEs.

7.2. IMPLICATIONS FOR FUTURE NBS FINANCING AND INCENTIVE MODELS

Despite significant public investment, funding levels for NbS remain inadequate to meet global climate and biodiversity targets. Closing this gap requires addressing key strategic questions regarding financing options, barriers, and strategies to increase investment. While public sector funding will remain essential, stronger private sector integration is crucial for scaling NbS, as it currently accounts for only 17% of total investment.

Significant investment in NbS can create up to 30 million green jobs, underscoring the economic and social benefits of these solutions. The increasing market demand for NbS, driven by regulatory changes and heightened awareness of climate issues, highlights the potential for business growth and economic development.

Supporting NbEs, which are mostly micro-enterprises focusing on balancing economic and non-economic goals with a strong emphasis on environmental and social objectives, is vital. NbEs rely on diverse financing sources, including personal savings, public funding, private investment, and reinvestment of profits. However, they face challenges in accessing traditional bank financing and often rely on grants and personal finances during their early stages. Support for voluntary CSRD/EU Taxonomy reporting for small NbEs could boost their attractiveness for corporate lenders.

The private sector capital providers, on the their hand, are calling for investment/planning security through national level policy commitments and schemes, recognition of NbS in Sustainable Finance frameworks as well as further development of datasets and tools/methodologies to ease and speed up NbS investment opportunity due diligence and monitoring.

Enhanced coordination and supportive policies at the different governance levels could drive more effective public sector investments in NbS. Setting nation-wide targets on nature developing incentive models, such as targeted tax benefits, green bonds, and Public-Private Partnerships, might attract more private capital. A growing green bond market specifically designed for NbS projects could further incentivise private investment, as green bonds are repeatedly named by the private sector capital providers as the most suitable NbS financing instrument. Streamlined grant programs should prioritize impact-driven projects, with funding tied directly to measurable environmental and social outcomes, potentially leveraging the EU Taxonomy of sustainable economic activities (and other similar taxonomies internationally). Encouraging corporate sustainability initiatives and mandatory reporting frameworks, like CSRD, could further boost private sector engagement in NbS and help signal to private investors, which companies can be considered eligible sustainable investees positively contributing to a range of sustainability objectives, supported by NbS.

7.3. POLICY RECOMMENDATIONS AT LOCAL, NATIONAL AND EU LEVEL

7.3.1. LOCAL LEVEL

- **Institutional finance**: as NbE/NbS are emergent concepts, banks may be unaware of the credentials of this industry sectors. One recommendation is specific awareness raising actions among banks. Further research and pilots of financial instruments targeted towards NbEs may be required.
- **Streamline funding processes**: unlocking the potential of local NbS requires reducing high transaction costs associated with funding applications and administrative procedures. Providing clear and accessible guidelines will empower local communities and small enterprises to navigate the funding landscape, making it simpler for them to access the necessary resources.
- **Coordination across departments**: enhance cooperation between different departments within local governments. Establish dedicated coordination mechanisms, such as task forces or committees with decision-making and budget power, to ensure effective communication and cooperation across sectors.
- **Better integration of NbS in spatial planning:** hurdles stemming from spatial urban planning rules in urban areas is a frequently cited barrier to NbS update and investment. A commitment to NbS needs to trickle down and result in mainstreamed supportive measures in all relevant areas of spatial planning.
- **Consider issuance of sub-sovereign green bonds:** green bonds emerge as one of the most suitable mechanisms for channelling private sector capital towards NbS implementation. A number of local governments in the EU are already successfully using green bonds for this purpose.
- **Tax incentives**: to stimulate greater corporate investment in NbS, it is recommended to implement tax incentives such as exemptions and deductions. Evidence from our research with NbEs demonstrates a significant shift from public to corporate investment in urban green building projects, indicating the potential effectiveness of similar incentives in attracting corporate investment to NbS initiatives.
- **Support for maintenance**: ensure that funding schemes not only cover the initial implementation of NbS projects but also provide resources for their long-term maintenance and monitoring.
- **Work together with local sustainable investors/lenders:** our research shows appetite among sustainable financial services providers to support government-led or backed NbS projects.
- **Capacity building and training**: provide training and technical support to local project developers and community members to build skills for project implementation, management, monitoring and reporting.
- **Promote local awareness campaigns** to increase the knowledge and visibility of NbS benefits among local decision-makers and the general public. Highlight the role of NbS in improving local environmental quality and community well-being.

7.3.2. NATIONAL LEVEL

- **Make strong commitments, setting nature- and biodiversity-related goals and targets:** including the promotion of NbS in various areas of policy implementation. This

creates trust in the private sector investor community and provides planning and investment security.

- **Clearly link NbS to climate-related goals and actions:** NbS are highly suited to support both mitigation and adaptation goals with multiple added co-benefits. Clear articulation of NbS role and prioritisation of NbS in climate change solutions, would serve as a strong signal to both project developers and investors.
- **Establish clear policy frameworks**: develop and enforce clear definitions, standards, and regulations for NbS to provide a stable and predictable policy environment that facilitates private sector participation in NbS projects.
- **Recognize NbEs at national and EU policy level**: establish a clear distinction between traditional SMEs and NbEs within national and EU policy frameworks to recognize the unique contributions of NbEs to environmental goals and ensuring they receive appropriate targeted policy support. This will enhance the visibility and credibility of NbEs but also unlock access to dedicated funding streams.
- **Cross-sectoral coordination**: enhance cooperation between different governmental departments and establish national or regional coordinating bodies to ensure cooperation across different departments and sectors. These bodies can facilitate integrated planning, joint financing approaches, and knowledge sharing between national and local coordination mechanisms to ensure alignment and effective implementation of NbS initiatives.
- **Prioritize applied research funding**: increase funding for research that directly translates to on-the-ground implementation strategies and strengthens public-private partnerships for knowledge exchange. Pilot innovative financial mechanisms for NbEs, focusing on capturing the value of their multiple impacts and addressing shortcomings of existing schemes. This research should generate data and expertise that demonstrate the effectiveness and financial viability of NbS projects.
- **Promote public-private partnerships**: encourage collaboration between public and private sectors for NbS investments through tax incentives for companies investing in public projects, joint financing approaches, and blended finance mechanisms to de-risk projects and attract private capital.
- **Consider sovereign green bond issuance** with use of proceeds invested in NbS. Government green bonds are highly ranked and coveted as a sustainable investment among private financing providers.
- There is a strong support among the private financial services entities for the **establishment of mandatory nature/biodiversity impact compensation/offsetting schemes** – as the generation of biodiversity credits can create an NbS revenue stream resolving the inherent issue of NbS not being seen as “investable” due to the lack of identifiable revenue opportunities. However, this needs to be implemented with great caution and with safeguards against misuse and proliferation of sub-par quality biodiversity offsets.

7.3.3. EU LEVEL

- **Direct support for local implementation through diversified funding**: increase the overall funding for local NbS projects at the EU level and shift towards innovative leveraged funding models that blend public and private funds to de-risk investments. Provide tailored guidance and simplify access to EU funding schemes for local projects by streamlining application processes and reducing administrative burdens.
- **Mainstream NbS policies into broader policy framework and Sustainable Finance framework and instruments**: enhance the effectiveness and scalability of NbS by

embedding them into the broader policy landscape, ensuring integration across environmental, economic, and sustainable finance policies. This includes mainstreaming NbS into existing policy frameworks and explicitly incorporating them into the EU Taxonomy of sustainable economic activities, the related EU Green Bond Standard as well an ESG benchmark regulations. A coherent policy framework will set criteria to ensure NbS substantially contribute to sustainability objectives, prevent conflicting goals, safeguard against potential harms, and facilitate access to a larger pool of funding.

- **Recognize NbEs at national and EU policy level**: establish a clear distinction between traditional SMEs and NbEs within national and EU policy frameworks to recognize the unique contributions of NbEs to environmental goals and ensuring they receive appropriate targeted policy support. This will enhance the visibility and credibility of NbEs but also unlock access to dedicated funding streams.
- **Standardized monitoring and reporting**: effective monitoring and evaluation systems are vital for tracking the implementation and outcomes of NbS projects, capturing both ecological and socio-economic outcomes. Leveraging advanced technologies such as sensors, AI, and remote sensing can provide real-time data and improve measurement precision. To ensure transparency, standardized reporting mechanisms should be implemented, offering consistent and comparable data for better decision-making by stakeholders. Additionally, dedicated research and innovation projects should explore applying these technologies in NbS use cases to enhance monitoring and evaluation efforts.
- **Foster knowledge exchange**: promote the exchange of best practices and knowledge among EU member states through centralized data repository and platforms. Successful NbS strategies and evidence-based innovations across different regions can enhance the replicability and scale up of these projects.

7.4. RECOMMENDATIONS FOR TAKE UP IN I4N (TOOLBOX AND DIFFERENT STAKEHOLDERS ENGAGEMENT IN WP4 AND 5) AND OTHER EU PROJECTS (LIKE GONP)

Deliverable 3.3 provides an important contribution to the literature on financing and business models for NbS. In particular, the literature review advances knowledge on mechanisms used outside Europe for financing of different types of NbS across different landscapes. The qualitative insights from important stakeholders (public sector, investors, NbEs) also provides up-to-date knowledge on how perspectives on financing have changed (or not) in recent years as the NbS concept has become mainstreamed in policy.

These up-to-date insights from Deliverable 3.3 will be shared with sister projects, directly with Naturance and more broadly through Task Force 3 (TF3) on Financing and Business Models for NbS in a Nature-Positive Economy (NetworkNature+). I4N partners play an important role in this Task Force, facilitating a number of working groups on themes such as financing of NbS, economic cost-benefit valuation approaches, business engagement and alignment with broader sustainability actions.

D3.3 will be shared with TF3 members as part of the I4N contribution to the development of a new EC expert publication on NbS in the Nature Positive Economy due for delivery at the end of 2024.

8. OUTPUTS FOR OTHER WPS

Deliverable 3.3 builds on the activities from Task 3.3 and is complemented by the upcoming report Deliverable 3.4, due in Month 28. While D3.3 focuses on the market and financing aspects of NbS, D3.4 will delve into the demand and supply chains of NbS markets. Together, these reports will offer a comprehensive overview of NbS market structures, actors, supply chains, and current financing and incentive models. Below a description of the inter-linkages between this report and other WPs.

8.1. WP2 DEVELOPMENT OF A CONCEPTUAL FRAMEWORK FOR VALUING NBS

The research conducted in D3.3 is underpinned by the conceptual frameworks and methodologies developed in WP2 “Development of a conceptual framework for valuing NBS”. The insights and frameworks from WP2 help to better understand the dynamics, barriers, and enablers of financing NbS. Specifically, the analysis includes a detailed exploration of the definition and categorization of NbS, as well as an examination of the associated societal challenges, benefits, and costs.

8.2. WP4 UNDERSTANDING STAKEHOLDER NEEDS AND ENABLING NBS READINESS

This report will contribute significantly to WP4, one of the aims of which is co-creation and implementation of innovative finance and business models for different NBS typologies and supporting the growth of the nature-based economy. Insights from different stakeholders in the public sector, investment community and nature-based enterprises will contribute to T4.2, which seeks to understand the investor community readiness for NBS take-up as well as the broader NBS related stakeholders’ needs and hurdles.

8.3. WP5 STAKEHOLDER EMPOWERMENT AND NBS MARKET CREATION

This report provides essential inputs to the Decision Support Toolbox and the basis for developing market creation strategies and testing innovative business models and investor readiness in WP5 “Stakeholder empowerment and NBS market creation“. D3.3 also contributes to a thorough understanding of the enablers and barriers for promoting the up-scaling and blended sustainable financing of NbS.

In T5.1, capacity building workshops will be organized with Living Labs to co-develop novel approaches to support stakeholders in developing financing, business and governance models. These workshops will draw on the novel insights from D3.3 to shape capacity building better tailored to the different NbS financing landscapes in Living Lab regions.

Further, in T5.3, the insights from the NbE survey will be leveraged to develop capacity building materials to support skills development of NbEs.

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8.4. WP6 DISSEMINATION, EXPLOITATION AND COMMUNICATION

D3.3 can synergistically support WP6 “Dissemination, Exploitation and Communication”, specifically in Task 3 “Towards Market uptake of I4N Solutions and Products”, which focuses on estimating the market potential for I4N solutions and products through literature analysis, interviews, and surveys.

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9. LITERATURE /REFERENCES

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APPENDIX

A1. Public sector interview guide

Interview guide

Benefits and barriers

1. It is expected that NbS will be much needed and implemented in the next few years. However, much less is being realized than expected. What is the problem from your point of view?
    a. What benefits (regulations, market developments etc.) are decisive for public institutions to invest in NbS?
    b. What barriers are there for NbS investments regarding public sectors?
    c. How could they be overcome from our point of view?
2. Role of governance
3. What could especially governance do to could motivate cities/private companies to invest more in NBS or accelerate investment in NbS?
    a. On local level?
    b. On national level?
    c. On EU level?
4. What possibilities do city authorities have themselves to incentivize NbS investment

A2. NbEs survey guide

NbEs Survey Questions

1. Name of organisation
2. Organisation's website or social media page
3. What year was your organisation established?
4. In what country was your organisation established?
5. What is the legal form of your enterprise?
6. At what stage of development is your organisation?
    a. Existence
    b. Survival
    c. Success
    d. Take-off
    e. Resource Maturity
7. How many employees does your organisation currently employ (FTE)
    a. 0-9
    b. 10-49
    c. 50-249
    d. >250
8. What was the turnover of your organisation in the last available accounting year?
    a. ≤ €2 million
    b. Between €2 million - €10 million
    c. Between €10 million and €50 million
    d. < €50 million

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9. What is the main goal of your organisation
    a. Economic
    b. Non-economic
    c. Hybrid
10. If non-economic, please specify your goals
    a. Only social goals
    b. Only environmental goals
    c. Social goals are of primary importance, followed by environmental goals
    d. Environmental goals are of primary importance, followed by social goals
    e. Social and environmental goals are of equal importance
11. If hybrid, please specify. Economic and…
    a. Social
    b. Environmental
    c. Social and environmental (of equal importance)
    d. Social and to a lesser extent environmental
    e. Environmental and to a lesser extent social
12. Does your organisation contribute to biodiversity net gain?
    a. Yes, directly
    b. Yes, indirectly
    c. Unsure
    d. No
13. What sector(s) are you involved in?
    a. Agriculture
    b. Coastal
    c. Forestry
    d. Urban
    e. Water Management
14. What is the level of market demand for your products and services?
    a. There is a strong increase in demand
    b. There is a slight increase in demand
    c. There has been no change in demand since we joined the market
    d. There is a slight decrease in demand
    e. There is a strong decline in demand
15. Please briefly elaborate on any change in market demand for your products and/or services, since you joined the market.
16. Where do you deliver most of your products and/or services?
    a. Locally
    b. Regionally
    c. Nationally
    d. Internationally
    e. All of the above
    f. Other
17. If you are involved in the implementation of nature-based solutions(NbS) what stage(s) are you most involved in?
    a. Planning/Design
    b. Delivery/Implementation
    c. Stewardship/Maintenance
18. Which of the following are important indicators of success for your organisation?
    a. Increased number of staff
    b. Increase in revenue
    c. Increase in funding
    d. Increase in measurable impact
    e. Increased return on investment

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f. Selling of your organisation for profit

19. Please indicate the most important sources of funding for your organisation at different stages of development (start-up, current, future plans).
    a. Personal
    b. Public
    c. Institutional
    d. Private
    e. Profit
20. Please briefly elaborate on the specific types of financing you have used at different stages of development.
21. If you do not use private sector funding, please tell us why.
22. How much of a challenge is financing for your organisation?
    a. The most important challenge we face
    b. A moderately important challenge
    c. Somewhere in the middle
    d. A minor challenge compared with other challenges
    e. Not a challenge at all
23. Rank these barriers to financing – *within your organisation*
    a. Knowledge i.e. lack of knowledge on different financing options
    b. Internal resources i.e. lack of time or capacity within your organisation to explore financing
    c. Support measures i.e. existing public sector grants/supports aren't suitable for you (and how you are set-up)
    d. Investor alignment i.e. disparity between your needs and private investors needs
    e. Lack of interest in finding finance within your organisation
    f. Challenges measuring/monetising impact of your products/services
24. Rank these barriers to financing – *external to your organisation*
    a. Political
    b. Private i.e. lack of prioritisation for private investment in nature
    c. Procurement i.e. lack of prioritisation of nature in public and private tenders
    d. Legal/Regulatory i.e. lack of regulation in support of nature
    e. Social i.e. lack of public awareness/support
    f. Technical/Technology gaps or challenges with nature-based solutions
    g. Environmental i.e. impact of climate change and biodiversity loss on your organisation
25. Feel free to add any comments regarding barriers to financing.
26. Please briefly describe your business model.
27. Through what networks do you keep informed about current and emerging trends in your sector(s)
    a. Political/Policy
    b. Academic
    c. Industry/Professional
    d. Community
    e. Individual initiative
28. How does your organisation acquire different types of knowledge (technical, sales & marketing, financing, other business functions)?
    a. Institutional e.g. third level accredited courses
    b. Industry e.g. professional training/CPD, events, networking, webinars
    c. In-house e.g. knowledge transfer between skilled colleagues, learning-by-doing
    d. N/A
29. Where would you like to see more support in terms of capacity building and skills

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development for your organisation?

a. Measuring impact
b. Technical knowledge
c. Financing and business models
d. Communication and marketing skills
e. Business and market acumen

30. What is the average level of education in your organisation?
    a. Second level
    b. Third level – degree
    c. Third level – post-grad/master
    d. Third level – PhD
    e. Vocational
    f. Other
31. How would you rate the current level of training and education on nature-based solutions for practitioners? (1-10)
32. How would you rate your knowledge on nature-based solutions?
    a. High level of knowledge
    b. Good level of knowledge
    c. Some knowledge
    d. Little level of knowledge
    e. No knowledge
33. 'Nature-based enterprise' (NbE) is an umbrella term used to describe enterprises from multiple economic sectors who are driven by a common mission to *work with and for nature* to address climate change and biodiversity challenges. NbEs deliver 'nature-based solutions' which by definition contribute to biodiversity net gain as well as other solutions regarding climate change issues. **Having read this definition, would you consider your organisation to fit the definition of a NbE?**
    a. Yes, definitely
    b. Yes, somewhat
    c. Unsure
    d. No, not really
    e. No, definitely not

Investor community diagnostic survey

Invest4Nature WP3

Task Supporting Deliverables 3.3 and 3.4

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Online Survey Questionnaire

Introduction:

Financing nature-based solutions: investor community diagnostic survey

This survey is being carried out as part of the Invest4Nature research project, as well as supports a PhD thesis at the University of New South Wales. Invest4Nature is an EU-funded Research and Innovation project that contributes to the creation of a market for nature-based solutions (NbS).

For the purposes of this research **"nature-based solutions" are defined as:**
Solutions that are inspired and supported by nature, which are cost-effective, simultaneously provide environmental, social and economic benefits and help build resilience. Such solutions bring more, and more diverse, nature and natural features and processes into cities, landscapes and seascapes, through locally adapted, resource-efficient and systemic interventions.

Participant information and opt-in consent:

By continuing with filling in and submitting this survey questionnaire, you confirm that you have read and understood and consent to the following:

Participation in this survey is voluntary. You are free to withdraw from the study at any stage by not submitting the questionnaire. (*Note: we may not be able to accommodate withdrawal after the submission of fully anonymous questionnaire*). We do not anticipate any risks to study participants and there will be no financial incentives for people participating in this study.

If you decide to take part in the survey, you are asked to complete an online questionnaire. The questionnaire will ask you questions about how your professional organisation is considering (or not) financing for nature-based solutions. This will include, multiple choice, open-ended and rating-style questions. **It should take less than 10-15 minutes to complete.**

This survey is anonymous, and the responses cannot be traced back to the respondent or professional organisation. No personally identifiable information is captured unless you voluntarily offer personal or contact information in any of the comment fields. Additionally, your responses are combined with those of many others and summarized in any publications resulting from this survey to further protect your anonymity.

The survey is open for participants who are affiliated with financial sector organisations.

Detailed project information is available at: https://osf.io/gma3b

Contact person:
Linda Romanovska

PhD Candidate
Faculty of Built Environment
University of New South Wales
and
Principal
Melomys Advisory (Invest4Nature patner)
linda@melomys-advisory.com

- I understand I am being asked to provide consent to participate in this research study;
- I have read and understood the participant information provided above;
- I understand the purposes, study tasks and risks of the research described;
- I provide my consent for the information collected to be used for the purpose of this research study only;
- I have had an opportunity to access detailed project information and I am satisfied with information provided;
- I freely agree to participate in this research study as described and understand that I am free to withdraw my participation by not submitting this questionnaire and withdrawal will not affect my relationship with any of the named organisations and/or research team members.

By continuing with filling in and submitting this survey questionnaire, you confirm that you have read and understood and consent to the following:

Participation in this survey is voluntary. You are free to withdraw from the study at any stage by not submitting the questionnaire. (*Note: we may not be able to accommodate withdrawal after the submission of fully anonymous questionnaire*). We do not anticipate any risks to study participants and there will be no financial incentives for people participating in this study.

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- I am affiliated with a financial sector organisation and consent to the above
- I am not affiliated with a financial sector organisation or do not consent to the above

Part 1: Respondent Profile - general

1.1 What type of organization do you represent?
- Investment Fund/Asset Manager
- Bank/Credit institution
- Insurance
- Asset owner/pension fund/sovereign wealth fund
- Other Investor:_____
- Other: _____

1.2 What is the geographic scope of operations of your organization in terms of the location of financing recipients?

[provide a list of regions]

1.3 Are your investing/lending activities targeted at specific sectors or project types?

- Yes

  If yes,
  1.3.1 Please provide details:

[enter your response here]

- No

Part 2: Respondent Profile - sustainability

2.1 Does your organisation identify/market itself as “sustainable”, “green”, “impact” or similar investor/lender?

- Yes

  If yes,
  2.1.1 Please explain:

[enter your response here]

- No

2.2 Does your organisation have a sustainable/impact investing or lending strategy?

- Yes

  If yes,
  2.2.1 Which of these sustainability targets are included in the strategy?

  - Climate change mitigation (incl. energy efficiency)
  - Climate change adaptation
  - Sustainable use of Water
  - Pollution reduction
  - Circular economy, recycling
  - Resource efficiency (excl. energy efficiency)
  - Biodiversity benefits, ecosystem restoration
  - Better education
  - Better health/healthcare

- Human rights (including socially fair supply chains)
- Promotion of peace/reduction of crime and violence
- Diversity and inclusion (incl. gender equality, opportunities for disadvantaged genders)
- Poverty reduction
- Other:

[enter your response here]

2.2.2 Do investments/lending for nature-based solutions (refer to the definition above) align with your sustainable/impact investing or lending strategy goals?

- Yes
- No
- Other:

[enter your response here]

- No

2.3 Does your organisation offer sustainable investment/lending streams to recipient entities/projects/activities?

- Yes

If yes,
2.3.1 Which sustainable investment/lending streams does your organisation provide to recipient entities/projects/activities?

- Green/sustainable loans – general lending
- Green/sustainable loans – project lending
- Green/sustainable loans – mortgages
- Green/sustainable loans – other targeted purposes
- Sustainability-linked loans
- Equity investment
- Investment in green bonds
- Investment in social bonds
- Investment in sustainability-linked bonds
- Charitable/impact (not-for profit) investments
- Other:

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[enter your response here]

- No

Part 3 – Use of terms

3.1 Does your organization use the term “investability” or “bankability” or similar?

- Yes

  If yes,
  3.1.1 Which of these factors are part of the definition of the term for your organization:

  - Generating continued revenue stream(s)
  - Potential for a profitable “exit” strategy (equity growth)
  - Achieving sustainability/impact goals/targets
  - Overall good financial health and credit history of the recipient
  - High ESG ratings
  - Alignment with your investment goals (sustainability)

  3.1.2. Please share any other aspects of the term that are important for your organization:

[enter your response here]

- No

Part 4 – NbS financing readiness and methodologies applied

4.1 Do you currently invest in/finance or plan to invest in/finance in nature/ natural capital/nature-based solutions or similar?

- Yes

  If yes,
  4.1.1 Which of these are the closest to the nature investments/financing you do or plan to do?

  - Green/blue infrastructure (e.g. nature in built environment)
    Please provide details:

[enter your response here]

- Nature-positive businesses or projects (e.g. those with nature-positive commitments, or with substantial positive impacts on nature)
  Please provide details:

[enter your response here]

- Nature-positive, biodiversity supporting use of proceeds instruments (e.g. nature-related bonds),
  Please provide details:

[enter your response here]

- Natural Capital assets
  Please provide details:

[Enter your response here]

- Biodiversity credit/offset projects
  Please provide details:

[enter your response here]

- Specific nature-based solutions
  Please provide details:

[enter your response here]

- Other investments with nature/biodiversity co-benefits
  Please provide details:

[enter your response here]

- No

4.2 Which methods do you apply or plan to apply for nature-related investment appraisal/assessments?

- CBA - Cost Benefit Assessment
- LCA – Life-Cycle Assessment
- "Value at Risk" Method
- Other:

[enter your response here]

4.2.1 What are the advantages and disadvantages you have observed with your chosen methods?

[enter your response here]

4.2.2 Are there important knowledge gaps for the application of the chosen methods?

[enter your response here]

4.3 What are the key types of benefits/disbenefits you assess when evaluating a potential nature-related investment/lending?

- Social benefits/disbenefits:
  - Aesthetic and local distinctiveness
  - Human health and recreation
  - Job creation and education
  - Social cohesion, crime reduction and equality
- Economic/financial benefits/disbenefits:
  - (Increased) monetary costs
  - Implementation costs / cost increase
  - Maintenance costs/ cost increase
  - Disposal costs/ cost increase
  - Operating costs (including for resources, such as energy, water)
  - Other costs
  - Cost and tax/fee savings
  - Income from NbS use, taxation or sale of credits
  - Increased property value
  - Provisioning of food, materials and energy
  - Reduced need for/load on other infrastructure
- Environmental benefits/disbenefits:
  - Climate change mitigation
  - Climate regulation (adaptation) - indoor and outdoor comfort, climate impact alleviation
  - Environmental quality - for ecosystem benefit (including biodiversity)
  - Environmental quality - for human benefit

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- Resource preservation/efficiency
- Water flow management
- Disaster risk managemenr (non-cliamte)

- Other

[enter your response here]

Part 5 – General NbS investability/bankability

5.1 In your opinion, do nature-based solutions generally have a high or low bankability/investability/potential?

- High investability/bankability
- Low investability/bankability
- Other

5.1.1 Please provide the key arguments supporting your answer:

[enter your response here]

5.2 In your view, are there any types of nature-based solutions, which have a higher potential of bankability/investability?

[enter your response here]

5.3 In your view, which nature-based solution project developers/owners (e.g. public vs private sector, larger vs. smaller etc.) are likely to be viewed as more trustworthy, and therefore the project more bankable/investable?

[enter your response here]

5.4 In your opinion, which financing mechanisms/instruments offered by your type of organization are the most suited for nature-based solutions projects?

- Equity investments – early stage
- Equity investments – mature stage

- Purchasing of green bonds (where use of proceeds is in nature-based solutions)
- General lending loans
- Project/special purpose loans
- Not-for-profit investments or grants
- Other:

[enter your response here]

Part 6 – Barriers

6.1 EIB has recently identified these as key barriers hindering private capital flows to nature-based solutions, please rate these barriers from your perspective:

	Not a barrier	Somewhat a barrier	Significant barrier	Don't know, can't say
6.1.1 Challenges in identifying and assembling relevant information on the performance of nature-based solutions				
6.1.2 Gap in knowledge and skills within investor/lender teams				
6.1.3 Lack of coordination between various actors, necessary for NbS financing and implementation				
6.1.4 High transaction costs				
6.1.5 Small/insufficient scale of NbS projects				
6.1.6 Long time-frames for implementation (and financial returns)				
6.1.7 Inherent uncertain risks/higher risk profile				
6.1.8 "The challenge of public goods" – NbS produce a mix of public and private goods and the private benefits alone may not exceed the cost of the project				
6.1.9 Limited valuation mechanisms/methodologies for NbS				
6.1.10 Lack of clear revenue sources				
6.1.11 High input costs				
6.1.11 Lack of standardised KPIs/metrics for measuring and monitoring NbS performance				
6.1.12 High localisation, NbS are hard to scale by replication				
6.1.13 Regulations requiring a high level of liquidity of investment				
6.1.14 Lack of inclusion of NbS in Sustainable Finance regulations/frameworks				
6.1.15 Limited size and financial capacity of the recipient of the financing				

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6.1.16 Other				

Please provide comments to your answers above:

[enter your response here]

Part 7 – Solutions addressing barriers

7.1 Which of these **knowledge** solutions do you see as most beneficial and urgently needed for addressing barriers hindering private capital flows to NbS? Please rate the solutions from your perspective:

	Not significantly beneficial/urgent	Somewhat beneficial/urgent	Significantly beneficial/urgent	Don't know, can't say
7.1.1 A Methodology/software which facilitates cost-benefit assessment for NbS (with own data input)				
7.1.2 A methodology/software which facilitates a life-cycle assessment of costs and benefits (with own data input)				
7.1.3 A database of the suitability of various types of NbS for solving specific issues				
7.1.4 A database listing potential benefits and disbenefits of various NbS types				
7.1.5 Methodologies/software for the quantification of economic, social and environmental benefits and disbenefits				
7.1.6 A database of implementation and maintenance costs of various NbS				
7.1.7 A database of quantified environmental impacts of various NbS types				
7.1.8 Other				

Please provide comments to your answers above:

[enter your response here]

7.1 Which of these **policy** solutions to the key barriers hindering private capital flows to NbS you see as most beneficial and urgently needed? Please rate the solutions from your perspective:

	Not significantly beneficial/urgent	Somewhat beneficial/urgent	Significantly beneficial/urgent	Don't know, can't say

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7.1.1 Inclusion of various types of NbS in sustainable finance Taxonomies (e.g the EU Taxonomy of Sustainable Economic Activities)				
7.1.2 Explicit inclusion of NbS in Green Bond standards (where policy-led)				
7.1.3 Inclusion of biodiversity considerations/criteria in ESG Benchmark regulations for indices (e.g. EU Benchmark Regulation)				
7.1.2 For countries to set clear climate-related targets and action/transition plans with the role of NbS explained				
7.1.3 For countries to set nature-restoration related targets and action/transition plans with the role of NbS explained				
7.1.4 Better accommodation of NbS in urban planning/zoning				
7.1.5 Introduction of mandated biodiversity impact compensation/offsets				
7.1.6 Other				

Please provide comments to your answers above:

[enter your response here]

7.2 Can any other knowledge, policy or other types of solutions help reduce the barriers?

- Yes

  If yes,
  2.1.1 Please provide details:

  [enter your response here]

- No

Part 8 – Contacts and follow-up (optional)

8.1 Would you like to be informed about the outcomes of this survey?

- Yes
- No

8.2 Would you like to be contacted for future opportunities to engage on the topic (e.g. to discuss the topic with researchers and NbS project developers)?

- Yes
- No

If yes to any of the above, please provide email address. The collection of email addresses will be kept separate from the answers to the survey and cannot be linked for responses.

email

Part 9 – Thank you message

Thank you for participating in the survey!
Your valued responses have been recorded.

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