

From Nature-Based Solutions to the Nature-Based Economy



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Executive Summary

Decades of research and more recently public policy recognise that current economic practices are not compatible with a healthy planet. The [European Green Deal](#) aims to decouple economic growth from resource usage, decarbonise industry and do this in a fair and just way for society. Nature-based solutions (NBS) to address societal challenges have been identified as an important policy instrument to achieve the aspirations of the European Green Deal and other key policy objectives such as those set out in the [EU Biodiversity for 2030 Strategy](#) and the ambitions of “building back better” from the impact of COVID-19 in the [EU Recovery plan](#). The European Commission identifies nature-based solutions (NBS) as those solutions to societal challenges 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”* (Faivre et al., 2017). Nature-based solutions provide multiple benefits for biodiversity. While much focus to date has been on the environmental or social benefits of NBS, less attention has been paid to their economic potential and their role in a just transition to the type of sustainable economy envisaged in the European Green Deal.

This White Paper addresses this imbalance by proposing a paradigm shift - **a new approach to valuing natural capital and to enabling its incorporation in the economic system.**

This document is a synthesis of a longer background report under preparation by the Nature-Based Economy Working Group of Task Force III of the European Commission. The recommendations of this document will be debated at a high level policy dialogue at the end of June 2021¹ following which they will be shared as part of an open consultation process running until mid September 2021. The outcome of this process will form the basis for an EC Expert Publication on the Nature-based Economy to be launched at the European Business Summit in November 2021.

The recommendations of this White Paper provide a basis for dialogue with policy makers, at all levels of government and across all fields of policy implementation, and with wider stakeholders in business, society and the innovation ecosystem on the changes needed to shift towards a Nature-based Economy. It particularly aims at stimulating valuable cross-sectoral policy discussions between policy makers responsible for climate change and biodiversity policy and those responsible for sustainable economic growth policies within the context of rapidly depleting stocks of natural capital.

¹ High level policy dialogue on Nature-based Economy organised on 29th of June 2021 as part of the Connecting Nature Enterprise Summit. Content available following the event on connectingnature.eu

Section 1: Why do we need a Nature-based Economy?

We propose the following definition of the Nature-based Economy as the starting point of an open consultation process: *“The Nature-based Economy encompasses all production, exchange and consumption processes related to activities concerned with the protection, conservation, restoration and sustainable use of natural resources by consumers, industry and society at large”*. With this definition, we position our analysis and recommendations within the ‘Economy’ domain (represented in Exhibit 1 and discussed further in [Section 2](#)) and take up the specific challenge outlined in the Dasgupta review of the ‘Economics of Biodiversity’ to focus on *“increasing the efficiency with which the biosphere’s supply of goods and services are converted into global output and returned to the biosphere as waste”* (Dasgupta, 2021, p.31).

We then set out the rationale for defining a nature-based economy based on the identification of four major limitations in current economic approaches. These are (1) current inadequacies in approaches to the pricing and valuation of nature; (2) a failure to take into account the diversity and interaction of actors in production and consumption; (3) a sustained lack of emphasis on resource inefficiencies; (4) the exclusion of decision-making processes in the formation of rules governing production and consumption. A paradigm shift towards a Nature-based Economy perspective is proposed which explicitly recognises nature as both providing a critical input to production and generating valued output in the economy. Attention is shifted from the role of individual actors, such as the public or private sector, to the integrated activities of all stakeholders in the ‘consumption’ and ‘production’ of nature. Inefficient use of natural resources, a finite source of capital, will be addressed by applying shadow pricing of ecosystem services in production and consumption activities coupled with tangible interventions to both reduce ‘consumption’ and increase ‘production’ of natural resources. Finally, the essential role of a range of actors in decision-making about the rules for production and consumption is incorporated as an important stand-alone process in the Nature-based Economy.

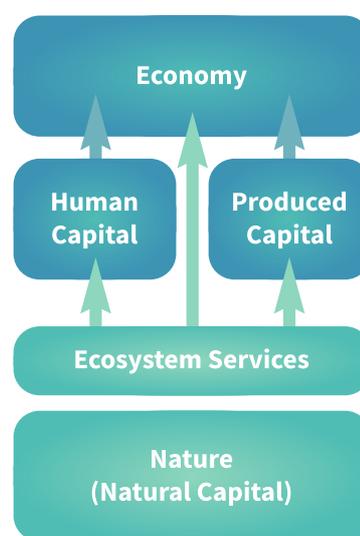


Exhibit 1: Links from Nature to the Economy
(Adapted from Dasgupta, 2021, p. 17)

Section 2: What is the role of NBS in the Nature-based Economy?

Section 2 begins by positioning NBS within a broader context to enable sustainable economic growth within the contexts of the climate change and biodiversity crises. At a European level some of the most relevant policy contexts include the [European Green Deal](#), the [EU Biodiversity for 2030 Strategy](#) and the [EU Recovery plan](#). At a global level, 70 governments,

private sector, civil society and international organizations signed up to the [NBS for Climate Manifesto](#) at the UN Climate Action Summit in 2019, and NBS have been identified as part of the pathway to a global movement towards achieving the goals of the [UN Decade of Ecosystem Restoration](#). The [IUCN Global Standard for NBS](#) and the [EC Handbook on Evaluating the impact of NBS](#) will greatly contribute to a more consistent understanding, implementation and measurement of the impact of this concept globally.

In this section, we consider different approaches to the valuation of nature within the context of a Nature-based Economy and identify the complexity of stakeholder value chains in the delivery of different types of NBS. We conclude that NBS have the potential to play a significant role in the Nature-based Economy - 'super-charging' the transition to sustainable development decoupled from resource utilisation and carbon emission growth. To deliver on this potential we need to consider how to secure active and ongoing participation across all stakeholders and sectors of the economy in an approach where all parties have a full understanding of the value of nature as both an input and output in economic processes.

Section 3: The Market for NBS

In Section 3, we present an overview of the market for NBS including key challenges and enablers to market development and undertake an analysis of the market forces of supply and demand. We examine clear patterns of growth in established NBS market sectors, such as green buildings, and identify the emergence of promising new sectors such as smart-tech for NBS and NBS for health and well-being. We review macro-environmental factors influencing overall market growth which include policy supports, economic valuation of NBS, technological drivers, inclusive governance and increased awareness of social justice aspects of NBS development.

From a policy perspective, stimulating demand and supply is not a simple proposition and requires consideration of the complexity of this market sector. A multiplicity of actors are involved in both demand and supply of nature-based solutions with varying roles across value chains in different market sectors. Participatory processes leading to effective user participation and an openness to innovative approaches are an essential starting point for consideration in any policies to stimulate market demand. Demand-led policies must take into account the nature of NBS as private goods and services (e.g. green buildings primarily paid for by the private sector but which may create public benefits such as urban cooling), public goods or services which can be enjoyed by many (e.g. urban parks primarily owned and paid for by the public sector but which may involve some private businesses such as coffee shops) and so-called common pool resources i.e. public goods where over-use of such resources would lead to negative effects (e.g. urban forests or nature reserves, again often owned and managed by the public sector, but with increasing evidence of effective management by

communities or NGOs). This section identifies that the market for NBS is at an early stage of development with much potential for growth. Section 3 considers challenges to supply and demand in the public sector highlighting the many knowledge gaps remaining, residual challenges measuring effectiveness, challenges related to hybrid governance and financing and a myriad of challenges related to public procurement which has led to difficulties finding skilled private sector suppliers of NBS.

This section concludes with results of recent research looking at suppliers of NBS from the private sector or 'nature-based enterprises'. The characteristics of nature-based enterprises are profiled in terms of size, stage of development, challenges and enablers. This section concludes that specific policies need to be put in place to support the start-up and growth of nature-based enterprises as a key enabler on the supply side to meet increasing market demand for NBS.

Section 4: Introducing a global perspective

In this section a range of initiatives to stimulate global market demand for NBS are summarised. Local governments are identified as a key enabler in this process with regional partnerships playing an important role in knowledge sharing. This section also highlights increased recognition of the role of the private sector and nature-based enterprises in the supply of NBS. The increased availability of international financing for NBS is seen as an enabler to market demand and growth.

Recommendations for discussion

Policy measures are proposed at global, EU, national and local government levels. Within each level, systemic measures needed for long-term transformative change, and immediate short-term actions needed to boost the market for nature-based solutions are put forward.

I. Global level

Systemic Change measures proposed at Global level:

- 1.** Implement concrete measures to incorporate the valuation of nature in both public and private practices. For example, encourage a shift or expansion of the focus from global reporting of GDP from 'single' capital (financial) to multiple capitals (financial, social, natural).
- 2.** Accelerate the activities of international networks, working groups and task-forces towards increasing and incentivising positive financial flows towards investment in nature.

3. Launch an open consultation on the positioning of “Nature-based Economy” concepts and related terminology such as “nature-based enterprises” in relation to other terms such as “circular bioeconomy”, “bioeconomy”, “nature-positive production”, etc.
4. Develop a comprehensive international framework for labelling, tracking, reporting and verifying the state of the Nature-based Economy.
5. Create an international multi-stakeholder database to increase data availability and improve decision-making related to the Nature-based Economy at a global level.

Immediate Actions to boost the NBS market at Global level:

1. Sustain measures to keep mainstreaming of NBS to the forefront of international and national governance, climate action and climate policy-related instruments.
2. Include more specific recommendations in global policies to facilitate investments in nature-based solutions in real terms. In the immediate short term, the public sector should be encouraged and supported to sustain and increase investment in NBS while in parallel, the international community puts in place systemic changes to incentivise increased private sector investment.
3. Agree a formalised strategic plan at the global level to introduce a cross-cutting modality of investment for nature-based solutions effectively creating an asset class for NBS.
4. Include specific and extensive financing for NBS in post-COVID economic recovery packages in all major economies.
5. Accompany increased investment in NBS with capacity building measures to stimulate the private sector supply of NBS leading to more innovation, job and enterprise creation.

II. EU level

Systemic Change measures proposed at EU level:

1. Improve policy alignment relating to NBS in Circular Economy and Bioeconomy strategies; increase policy collaboration with Regional policy and Enterprise policy.
2. Invest in EU wide research/market studies on the positioning and potential synergies between Nature-based Economy principles and other strategies and action plans identified to achieve the aspirations of the Green Deal including the EU Sustainable Finance Taxonomy.
3. Stimulate the development of NBS market sectors through measures taking into account NBS market characteristics (varying levels of market maturity) and challenges faced at market level (need for networking due to market fragmentation and early stage of development).
4. Embed multiple actors in decision-making processes on NBS at EU level.

5. Increase actions aimed at much higher levels of take-up of corporate and SME valuation of nature.

Immediate Actions to boost the NBS market at EU level:

1. Triple EU investment in NBS by 2030 and quadruple by 2050 as per the recommendations of the UN Report on the [State of Finance for Nature](#) (2021). Engage InvestEU, the EIB and the EIF in providing this financing. Align investment with tackling remaining roadblocks to NBS such as the need for transformative change at local government level.
2. Increase funding for knowledge exchange and collaboration between regions of Europe and the rest of the world, in particular the Global South.
3. Stimulate private sector supply of NBS through support for capacity building of nature-based enterprises (NBEs) and investment in NBS and NBEs in line with the EU Sustainable Finance Taxonomy.
4. Lead on the development of more comprehensive standards for different types of NBS to support market development. Standards will provide reassurances for buyers and verification of quality levels to help support and differentiate the offerings of suppliers.
5. Support EU and national platforms, networks and face-to-face NBS market events to connect nature-based enterprises with other actors across the supply chain. Support the organisation of match-making events between businesses and financiers focusing specifically on pro-biodiversity businesses or NBEs.

III. At national and local level

Systemic Change measures proposed at national/local government level:

1. Put in place measures to increase public sector adoption of approaches to capture, account and track the monetary and non-monetary value of nature and nature-based solutions.
2. Put in place measures to increase the understanding and valuation of nature in the private and third sector and to incentivise private sector investment in nature.
3. Implement capacity building measures to ensure that increased public investment in NBS leads to an increase in innovation and job creation in NBEs.
4. Embed participatory decision making processes in policy making in particular focused on increased engagement between local government and local business in the Nature-based Economy.
5. Deliver support and capacity building measures for local community and third party organisations to take on an increased role in co-governance of NBS.

Measures to stimulate demand:

1. Build a portfolio of NBS projects rated in terms of attractiveness for public and private sector investment.
2. Triple local government-led investment in NBS by 2030 and quadruple investment by 2050. Investment from the public sector should be prioritised in NBS where private sector investment is not attractive as the primary source of funding.
3. Increase public sector investment for pilots of novel approaches to NBS.
4. Stimulate private sector interest in investing in NBS through specific policy/regulation instruments e.g. 'nature-credit' scheme broadly based on carbon credit scheme.
5. Actions to increase investor understanding of NBS cost structure and business models.
6. Increase awareness and engagement of local businesses with communities and other actors in decision making processes around NBS.
7. Increase local business awareness of the direct benefits of NBS such as green building infrastructure leading to increased investment.
8. Introduce measures to increase the level of consumer awareness of the benefits of NBS.
9. Put in place measures to facilitate community financing of NBS.
10. Stimulate private demand through partnerships / platforms / infrastructure.

Measures to stimulate private sector supply of NBS:

1. Address barriers in specific NBS market sectors e.g. regulations hindering delivery.
2. Put in place financial incentives for nature-based enterprises to be started and scaled.
3. Contribute to the development of standards for NBS implementation at local/national level. Ensure NBEs are adequately represented in the development of standards.
4. Support platforms, networks and face-to-face industry events connecting nature-based enterprises with other actors across the supply chain.
5. Collaborate with relevant organisations to develop training and continuous professional development measures to increase the quality of NBS implementation.

Measures to address public procurement challenges:

1. Build the capacity of the public sector to take advantage of NBS opportunities through infrastructure, agencies and educational institutions.
2. Review and deliver the systemic changes needed to current procurement processes to better align with NBS non-monetary values and cost structures.
3. Change procurement processes to better accommodate smaller enterprises.
4. Increase awareness and recognition of the role of nature-based enterprises (NBE) in the NBS supply chain. Tailor procurement strategies to enable the development of new types of suppliers.
5. Incorporate Natural Capital assessment considerations into public procurement policies.

Finally, the potential of digital communications and the platform economy to accelerate NBS market development was recognised and measures are proposed to leverage this potential.

Conclusion

The 'Nature-based Economy' is a new concept which is at a very early stage of development. Robust feedback is needed from policy makers, practitioners and academics in the economics, public management and NBS fields on this concept, and the recommendations proposed in this paper in support of this concept.

We invite you to contribute to the consultation process on the concept and recommendations. Please visit us on networknature.eu/Nature-Based-Economy-White-Paper-Consultation to complete a short feedback survey on priority recommendations and/or to submit a longer feedback document as part of this consultation process. Consultation will close on 10th September 2021. The final publication will be presented at the European Business Summit in November 2021.

Introduction

“Nature is at the heart of our growth strategy, the European Green Deal, and is part of a European recovery that gives more back to the planet than it takes away.”

Ursula von der Leyen, EC President, May 2020

The [European Green Deal](#) recognises that current economic practices are not compatible with a healthy planet. We need to decouple economic growth from resource usage, decarbonise industry and do this in a fair and just way for society. Nature-based solutions to address societal challenges have been identified as an important policy instrument to achieve the aspirations of the European Green Deal and other key policy objectives such as those set out in the [EU Biodiversity for 2030 Strategy](#) and the ambitions of “building back better” from the impact of COVID-19 in the [EU Recovery plan](#). Nature-based solutions (NBS), as defined by the European Commission (2020), contribute to climate adaptation and mitigation, increase biodiversity, contribute to the improved health and wellbeing of society and have the potential to contribute to a sustainable economy. While much focus to date has been on the environmental or societal impact of NBS, less attention has been paid to the economic potential and the role of NBS in a just transition to a sustainable economy.

This paper addresses this imbalance, proposing a paradigm shift in economic perspectives in favour of a new approach founded on a clear understanding and valuation of natural capital in the economic system. Nature-based solutions play a vital role in such an approach and the emerging market for NBS is described in this document. Recommendations on measures needed to stimulate systemic change towards a Nature-based Economy are provided as a framework, including specific measures to stimulate demand and supply of NBS, given their integral role in the Nature-based Economy.

This consultation paper is aimed at policy makers at all levels of government and across all fields of policy implementation. We hope it will be valuable in stimulating cross-sectoral policy dialogues between those policy makers responsible for climate change and biodiversity policy and those responsible for sustainable economic growth policies within the context of increasing business risks from rapidly escalating depletion of natural resources.

Consultation Process towards an EC Expert Publication

This draft White Paper is a synthesis of a longer working document under preparation by the Nature-based Economy Working Group of Task Force III of the European Commission. The members of this task force come from academia, policy and practice and are representatives of EU funded projects undertaking research and demonstration in the financing, governance and business models of NBS. Contributions to the Working Group today come from eleven Horizon 2020 projects (Connecting Nature, URBiNAT, UrbanGreenUp, REGREEN, Clearing

House, Network Nature, Future Mares, MERCES, NAIAD, WeValueNature, Clever Cities) and the LIFE project ARTISAN².

The recommendations of this draft White Paper will be debated at a policy dialogue as part of the Connecting Nature Enterprise Summit on 29th June 2021 following which they will be shared as part of a wide consultation process running from 1st July to 10th September 2021. Thereafter inputs into the draft White Paper consultation process will be taken into account in the working document of the Nature-based Economy Working Group. This working document will form the basis for an EC Expert Publication on the Nature-based Economy which will be launched at the European Business Summit in November 2021.

What is a Nature-based Economy?

In this draft White Paper we propose the following definition of the Nature-based Economy as a starting point for consultation: *“The Nature-based Economy encompasses all production, exchange and consumption processes related to activities concerned with the protection, conservation, restoration and sustainable use of natural resources by consumers, industry and society at large”*. Policy, regulation, institutions and/or cultural and community narratives relating to the rules and norms governing these activities are essential and integral elements of the production, consumption and exchange processes of the nature-based economy.

Structure of this draft White Paper

- In **Section 1** of this draft White Paper we provide a rationale for transitioning from conventional economic models to the perspective of a Nature-based Economy.
- In **Section 2** we look at the positioning of NBS in the wider Nature-based Economy. We consider the policy rationale for NBS within the overarching context of Europe’s Green Deal strategy. We look at the actors involved in the value-chain of NBS and we review different approaches to valuation of nature including the natural capitals perspective.
- In **Section 3**, we present an overview of the market for NBS, including key challenges and enablers of market development and we consider in-depth forces of supply and demand. The concept of nature-based enterprises is identified as a key enabler of market supply to meet increasing market demand.
- **Section 4** introduces a global perspective on the Nature-based Economy focusing in particular on NBS and nature-based enterprises.
- The final section builds on previous chapters to present a detailed list of **policy recommendations** in support of a transition towards the Nature-based Economy.

² For a list of projects with descriptions, see [Acknowledgements](#)

Section 1 - Why do we need a Nature-based Economy?

“Like investors know, today’s externalities are tomorrow’s risks, because externalities do get internalised – by design, by decree or by disaster. And you don’t want the third kind to happen as a C-suite executive or investor. For this reason we need a common valuation framework.”

Pavan Sukhdev, President of [WWF International](#) and representative for the [TNFD Partner Group](#)³

When we speak of an ‘economy’, the traditional understanding of this generally begins with the buying and selling of goods and services. An economic system also incorporates the deployment of factors of production by firms to create these goods and services for the purpose of creating wealth for themselves and at the same time providing incomes to households to enable their purchase.

This traditional perspective on an economy has at its core a focus on the increased consumption of goods and services by households (through efficient production, and allocation through exchange) and wealth creation for firms through ever more innovative uses of the factors of production and exchange processes that maximise the efficient allocation of scarce resources between these actors.

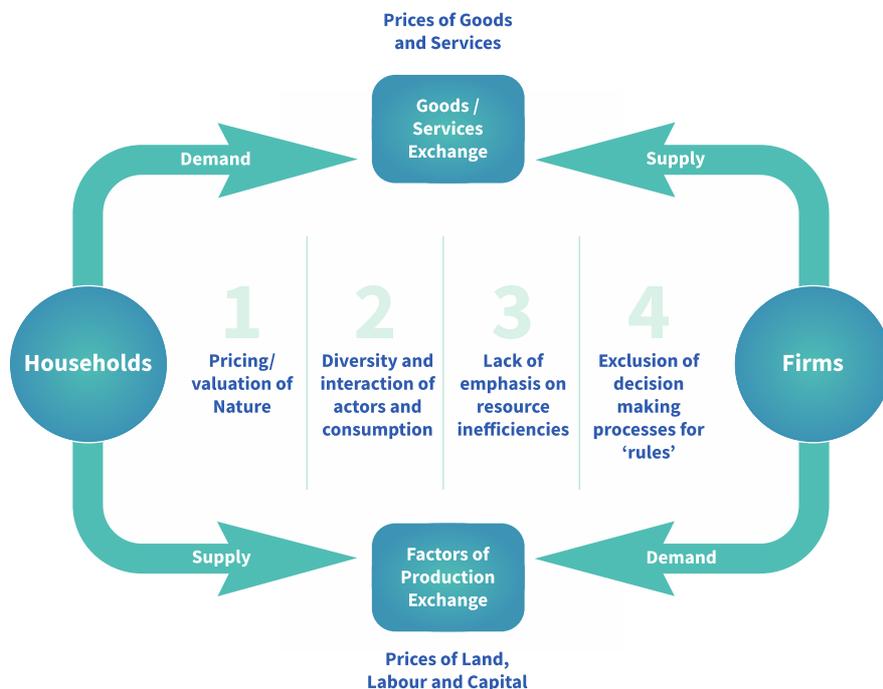


Figure 1.1 Limitations in the traditional economic perspective
(Adapted from Samuelson, 1961)

³ Speaking at the official [global launch of the Taskforce on Nature-related Financial Disclosure](#) (TNFD) 14/6/21

However, it has been long understood that this is only a part of the bigger picture in developing policies and institutions to ensure a thriving economy and society. A simplified diagram of these basic elements is provided in Figure 1.1 alongside an overview of the limitations of this approach from a Nature-based Economy perspective.

1.1 Limitations of current economic approaches

This paper highlights four specific limitations of a traditional economic perspective that a 'Nature-based Economy' perspective seeks to address.

Valuation and pricing of nature: The first is the limitation in relation to the unsustainable impact of production and consumption on the natural environment – which in economic terms is attributed to a failure to explicitly value and, more specifically, to put a price on nature (WEF, 2020). While there have been decades of economic impact policies, regulations and taxes that have attempted to 'price in' the cost of production and consumption to the environment, this has clearly not been effective in materially changing the unsustainable trajectory towards catastrophic climate change, loss of biodiversity and exhaustion of natural resources (IPBES, 2020; Dasgupta, 2021). A Nature-based Economy will focus on the impact of production and consumption activities on nature – both in terms of a stock of natural capital that can be increased or decreased through Nature-based Economy processes, and as a flow of (eco)services as direct and indirect inputs to production and consumption activities in the Nature-based Economy system.

Diversity and interaction of actors in production and consumption: The second limitation relates to the traditional differentiation between spheres of public and private goods. Public goods are those that can be 'freely' enjoyed by everyone – with nature often used as an example of a public good for which the public sector plays a stewardship role; while private goods are limited in their availability and most efficiently allocated through market mechanisms. However, it is abundantly clear that nature is not 'free' (Dasgupta, 2021) and that private (profit, non-profit and philanthropic) entities play a significant role in stewardship and allocation. Furthermore, for many 'private' goods and services deemed essential for citizens (e.g., health, education, housing), the state or non-profit organisations are critical providers of these in order to ensure access by all citizens. This mixing of public & private production and consumption is particularly evident in the emerging NBS sector with actors across the public, private, community and non-profit sectors playing key roles in production processes and consumption spanning a broad spectrum of citizens, businesses and the public sector itself. A Nature-based Economy perspective will shift the focus away from specific roles for particular actors and instead focus on the activities of production and consumption across, and between actors, and the effect of these activities on the natural world.

In this paper we will focus specifically on interventions aimed at stimulating production that results in more efficient supply and demand through policy and practice incentives and capacity-building in nature-based economy processes.

Lack of emphasis on resource inefficiencies: The third limitation to be addressed is that economic models have only recently begun to address in earnest the question of reduction of resource usage in production and consumption activities. Inefficiencies in the production process were embedded in micro-economics as an efficiency consideration along with other factor costs – and the price of whatever was being ‘wasted’ determined whether or not the waste was something to worry about. On the consumption side, under-utilisation and waste of resources are gaining increased attention – with ‘circular’ and ‘sharing’ economy models considering consumption activities along with production as key areas for leverage. The potential impact on nature of resource inefficiencies in production and consumption is especially acute (and has been recognised for years) and the subject of resource restoration is a key consideration in the UN Decade of Ecosystem Restoration and the EU’s Biodiversity Strategy for 2030. The European Green Deal provides an action plan for restoration of biodiversity and transition to a circular and bio-economy.

Exclusion of decision-making processes and stakeholders in the formulation of ‘rules’: The fourth limitation is the boundary between the economy and the policy / societal domains. Traditionally, the policies and regulations that set the ‘rules’ for production, exchange and consumption were seen as outside the day-to-day operation of firms and households. They were the ‘taken-for-granted’ facts of the system and – at best – were looked at as exogenous factors that could only be changed by actors outside the system. For example, a tax on pollution was conceived as a way of policy-makers changing the cost of production and a tax on plastic bags was an initiative to change the way households might choose to consume. But changing the ‘rules’ was not generally seen as an ongoing activity *within* the system. Ostrom’s (1990, 2010) approach to managing common pool resources was pioneering in demonstrating how stakeholders could (and should) be part of the governance / rule-setting activities and her institutional analysis and development (IAD) framework provided the necessary concepts and language for a more general integration between ‘context’ and ‘action’. The Nature-based Economy will incorporate decision-making in relation to the rules for production and consumption as an integrated activity domain, specifically but not uniquely with respect to NBS⁴.

Increasingly, local and national governments are establishing fora in which communities and businesses are encouraged to engage with policy-makers and public service managers in collaborative dialogue around how public policy, programmes and services may be

⁴ We note that “for an action to be considered a nature-based solution, it must adhere to certain principles, which include being done in the right places in the right ways, with the full participation and support of local communities and Indigenous peoples and as part of a broader program of climate action” (Nature4Climate, 2020, p.5).

reconfigured to facilitate economic, environmental and social outcomes via direct public action, but also via changing the ‘rules’ under which the private, community and non-profit sectors operate to produce and consume goods & services. Including these activities of ‘decision-making’ at various levels of spatial and institutional scale in the Nature-based Economy would open up a range of possible processes that could establish, assess, adjust and reinforce a trajectory towards systemic transformation of economic systems at various levels. In addition, the inclusion of these activities facilitates the incorporation of other value considerations of interest across stakeholders such as well-being, employment, social cohesion, etc.

1.2 The Nature-based Economy: a paradigm shift

Addressing these limitations requires a paradigm shift in the way we examine and intervene in an economy. Figure 1.2 provides an overview of the key features of the Nature-based Economy which will be explored in more detail in this paper. There are a number of related concepts in literature and policy such as the ‘circular’ and ‘bio-economy’ as described in the European Green Deal and the [Dasgupta Report](#) on the economics of biodiversity. However, as this is a rapidly evolving research and policy space we cannot cover all of the various perspectives that might be consistent or conflicting with how we are positioning the Nature-based Economy in this document. Our first recommendation is thus further research to clarify the positioning of the Nature-based Economy framework with existing and emerging terminologies.

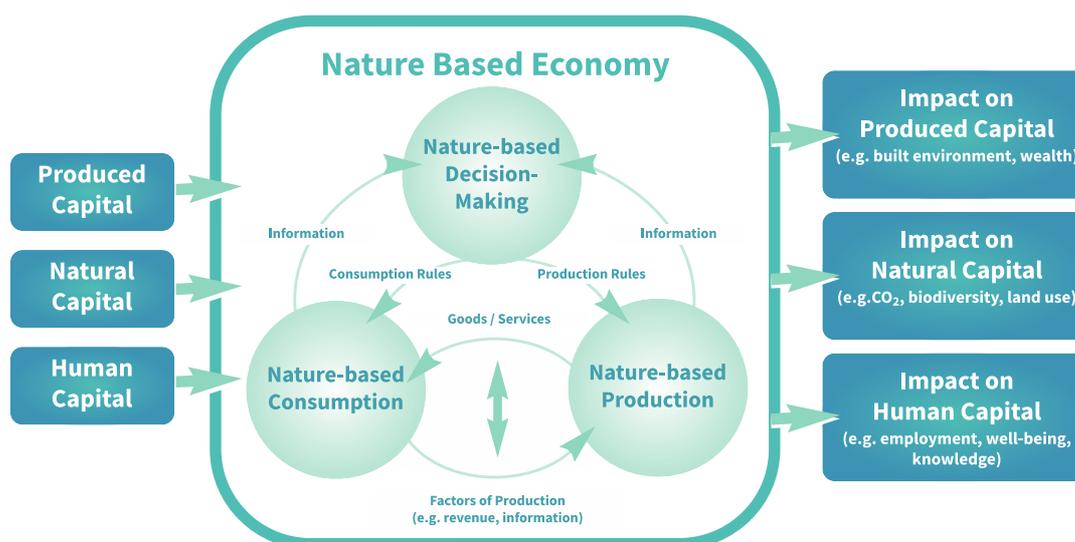


Figure 1.2 The Nature-based Economy perspective

The first limitation is addressed by explicitly incorporating nature as both an input into the three main processes of the Nature-based Economy, as well as a valued output of these processes. In Section 2 we discuss the ‘natural capitals’ approach to this re-imagining of the value of nature and mention other possibilities for valuing nature identified in the NBS family of projects.

In recognition of the diversity of actors involved across the supply and demand of goods and services, we reformulate the fundamental elements of our economic model to be processes of production and consumption in which a range of actors may participate and in which the interdependencies of actors on each other as well as on the resources required to produce and consume are recognised and incorporated into policy decisions. Having said this, we note that policy recommendations may still target specific groups of actors differently – as may be seen in the following sections and summarised in the recommendations section.

Furthermore, we can examine more directly how consumption processes may contribute to the “protection, conservation, restoration and sustainable use of natural resources” that forms the core of our definition of the Nature-based Economy and the inefficient use of resources across actors – which is the third limitation to be addressed. As mentioned above, resource usage and waste are already a part of individual business production process analysis, but the Nature-based Economy focus on processes rather than actors will facilitate a production / value chain analysis across actors (including consumers of NBS). Our policy recommendations are largely focused on stimulating demand for NBS, rather than those that might reduce consumption of other products and services in an effort to minimise the impact on nature.

The fourth limitation identified – that of not including ‘decision-making’ processes that set the rules for production and consumption – is addressed by the rather simplistic device of adding these activities as a third type of process in the Nature-based Economy perspective. Having acknowledged that this Nature-based Economy model is a work-in-progress, it is observed that decision-making processes needed to facilitate the development and scaling of NBS appear throughout this draft White Paper, but especially in the section on recommendations for approaches to policy and practice.

The shift in focus from specific (market) actors to processes of production, consumption and decision-making means that the activities of exchange must also be represented somewhat differently in the emerging perspective. Exchange of payment for goods and services may be directly represented as arrows between the activities of production and consumption. The exchange of the factors of production is more difficult to represent in the diagram. This is because the factors of production - including land, labour and capital (which we’ve reformulated as natural, human and produced capital - following Dasgupta 2021) – may be

controlled by those who wish to exchange these for the means to consume (as represented by households in the traditional economic models), but more often than not are controlled by different actors with different objectives.

In fact, the research and case studies reported in this paper assume resources to be at least as likely to come from those actors who wish to achieve specific outcomes via the Nature-based Economy; e.g. investors looking for ESG-type returns, government funding bodies with a mandate to fund NBS or other environmental initiatives, philanthropists with impact targets to meet etc.; as they do from households with particular consumption preferences within the Nature-based Economy. For this reason, we include the non-consumption related resource flows into the system as flows from 'outside' our consumption / production / collective decision-making system with the potential to direct these resources to any one of the activities with the objective of achieving one or more of the outcomes highlighted in our model.

Finally, in relation to outcomes, we have already noted that the impact on nature needs to be explicitly recognised as an output of the activities and this is central to the Nature-based Economy model. Furthermore the impact on wealth and human capital already present in the traditional economic perspective is recognised as arising from the Nature-based Economy - along with other, less prominent outcomes of 'employment' and the 'health and well-being' of citizens as evidenced by the exemplars and research reported in this draft White Paper.

Section 1: Summary

Section 1 proposes a first definition of the Nature-based Economy and sets out the rationale for a nature-based economy based on the identification of four major limitations in current economic approaches. These are: 1) current inadequacies in approaches to the valuation of nature; 2) a failure to take into account the diversity and interaction of actors in production and consumption; 3) a sustained lack of progress on addressing resources inefficiencies; and 4) the exclusion of decision-making processes in the formation of rules. A paradigm shift towards a Nature-based Economy perspective is proposed which explicitly recognises the value of nature as both an input as well as a valued output of the Nature-based Economy. The focus is shifted from the role of individual actors such as the public or private sector to the integration of these actors in the 'consumption' and 'production' of nature. Inefficient use of natural resources will be reduced through both an explicit pricing of nature and a combined effort to reduce 'consumption' and increase 'production' of natural resources. Finally, the essential role of decision-making in setting the rules for production and consumption is proposed as a stand-alone and equal process in the Nature-based Economy.

Section 2 - Nature-based solutions in the Nature-based Economy

In Section 2 we look specifically at NBS and their important role in the Nature-based Economy as framed within the policy rationale for NBS. We review different approaches to the valuation of nature including the natural capitals perspective and we look at the actors involved in the value-chains of NBS.

The European Commission defines nature-based solutions (NBS) as solutions to societal challenges “*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* (Faivre et al., 2017). Nature-based Solutions provide multiple benefits for biodiversity.

2.1 Policy rationale for NBS within the context of the Nature-based Economy

Nature-based solutions play a vital role in the Nature-based Economy. As shown in Figure 1.2, nature is considered as both an input into the consumption and production processes as well as a valued output of these processes. On the input side, stocks of natural capital and land use are intrinsically related. According to the Global Assessment Report on Biodiversity and Ecosystem Services published by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES, 2019), more than one million species of plants and animals are threatened with extinction, with changes in land use pointed out as the number one driver of this threat. The IPBES report highlights implementing NBS as an important response to addressing this crisis.

Over the last decade, NBS, such as green roofs, street trees or urban parks have increasingly been promoted as cost-efficient, no-regret solutions to address multiple challenges in cities and peri-urban areas at a global level. The multiple benefits NBS deliver have been highlighted in European and international frameworks such as the [EU Biodiversity Strategy for 2030](#), the [EU Green Deal](#), the [Urban Agenda 2030](#), the [UN Climate Action Summit 2019](#) and the [Convention of Biological Diversity’s Biodiversity Framework](#). The EU Biodiversity Strategy 2030 (and related strategies such as the Birds and Habitats Directives, the Green Infrastructure Strategy, the [EU Pollinators Initiative](#) and the new [EU Forest Strategy](#)) clearly recognise the vital role which nature plays in the economy and the potential of nature and NBS to contribute to sustainable economic development within the context of the European Green Deal. This strategy aims to halt the loss of biodiversity and ecosystem services in Europe as part of a global commitment within the international Convention on Biological Diversity (CBD).

Cities all around the globe are acknowledged as key players in global efforts to revert biodiversity loss and nature degradation (Committee of the Regions, 2020). Cities are increasingly incorporating NBS into their urban planning schemes and strategies to tackle urban challenges. NBS offer the economic, technological and social potential to foster nature-friendly urban space, lifestyles, businesses and solutions across different sectors of the urban realm (i.e. transport, production, trade, the construction sector and building retrofitting). Nature-based enterprises in the private sector delivering NBS offer significant potential for innovation, enterprise and job creation as part of the new growth strategy envisioned in the European Green Deal where economic growth is decoupled from resource usage. Investment in NBS and NBEs will be supported by the [EU Taxonomy for sustainable activities](#), which provides a clear classification system to enable and scale up sustainable investment in support of the implementation of the European Green Deal. The criteria established by the Taxonomy can provide a benchmark for standardised approaches to solution and service innovations which substantially contribute to increased nature-based economic activities, aligned with Europe's environmental objectives.

The outcomes of investment in NBS are increasingly measurable. NBS can tackle some of our most pressing environmental and societal challenges such as emission reduction, climate adaptation and mitigation, air and water quality pollution, halting biodiversity loss, but also promoting public health, food security and even social cohesion. At the same time, according to the European Environment Agency, in order to achieve the transition towards carbon neutrality and a more Nature-based Economy and society which operates within the limits of the planet, actions are required in sectoral policies such as transport, energy, industry and agriculture. The planning and delivery of NBS at a larger scale is one of three cross-cutting priorities in the [EU Adaptation Strategy](#) to systemically adapt to a changing climate, reduce risks, create resilience and achieve the goals.

Recognising the importance of incorporating biodiversity into NBS and land use policies, infrastructure and development planning, the European Commission (EC) has been financing research and demonstration projects to amplify innovation and expertise exchange within European cities and beyond. To frame and promote their work and strengthen biodiversity overall, the [InvestEU](#) programme will include a natural capital and circular-economy initiative to mobilise investment, whilst the [European Skills Agenda](#) will provide a framework for training and reskilling EU citizens across sectors to transition to a Nature-based Economy.

Furthermore, the Urban Agenda for the European Union, launched in May 2016, represents a new multi-level working method to promote cooperation between city governments, national governments and the European Commission and to improve policy and stimulate growth, liveability and innovation in European cities to successfully tackle socio-environmental challenges. Its [Partnership on the Sustainable Use of Land and Nature-Based Solutions](#) issued

an [Action Plan](#) in which the inaccessibility of financing and inadequate investment was outlined as a challenge for mainstreaming NBS

A [Handbook to evaluate the impacts of NBS](#) provides decision-makers with a comprehensive NBS impact assessment framework, a robust indicator set and methodologies to assess NBS (Wendling and Dumitru, 2021). The indicator set is structured across 12 societal challenge areas among which the one on ‘New Economic Opportunities and Green Jobs’ provides valuable contributions to analyse and foster a Nature-based Economy at subnational level.

In summary, NBS can play an essential role in the Nature-based Economy as:

- Vehicles for transforming cities / regions into preservers / creators and beneficiaries of ‘natural capital’ while boosting economic sustainability and contributing to social inclusion and well-being.
- Vehicles for blended public-private investment in biodiversity protection and net-gain, carbon emissions reduction, social cohesion, citizen well-being and green job creation.
- Enablers of innovation and scaling of ‘Nature-based Enterprises’ (NBEs) – which can provide economically sustainable, future-oriented and potentially more resilient products, services and jobs.

2.2 Typologies of NBS

NBS is an umbrella concept encompassing multiple dimensions (strategic, spatial planning, soft engineering and performance) and building on a vast knowledge-base of approaches including ecosystem services, ecosystem-based adaptation, ecosystem-based disaster risk reduction, ecological engineering, blue infrastructure, green infrastructure, blue-green infrastructure, Urban Forestry, Sustainable Urban Drainage Systems, Low-Impact design and other concepts (European Commission, 2021).

Eggermont et al. (2015) identifies 3 types of nature-based solutions, based on the level and type of engineering of biodiversity and ecosystems, and as a function of both the number of services and stakeholder groups involved and the maximisation of the delivery of key services (Figure 2.1). The latter also refers to the benefits generated.

NBS will generally involve activities in all three domains of the Nature-based Economy: consumption, production and decision-making.

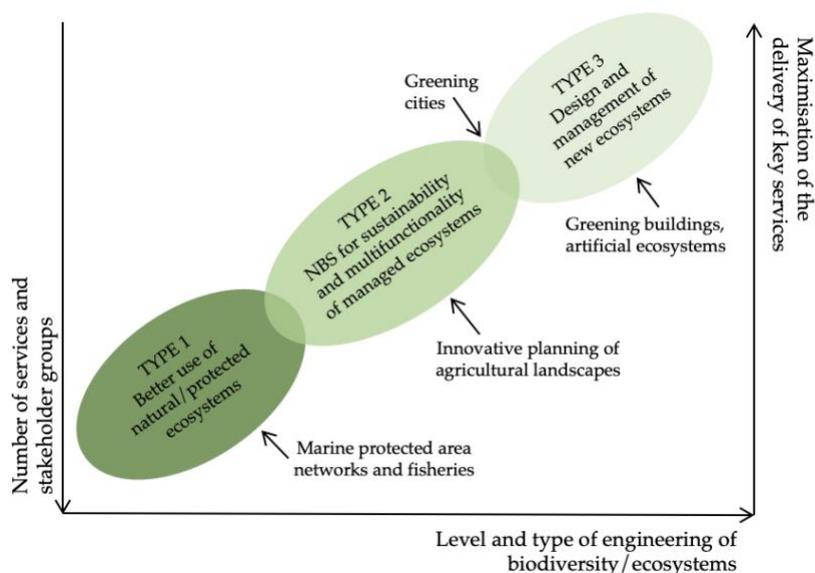


Figure 2.1 Typology of Nature-based Solutions

(Adapted from Eggermont et al., 2015)

‘**Consumption**’ of (or demand for) different types of NBS is related to the better use of protected natural areas (Type 1), increased utility from enhanced multifunctionality of existing parks and public spaces or from increased sustainability of managed ecosystems such as sustainable forestry and agriculture (Type 2) or for demand for the design and management of new types of ecosystems e.g. green roofs, green buildings (Type 3).

In some types of NBS such as Type 3, private consumption and production (led by the construction industry) are more prevalent than in other types of NBS where **production** activities are largely led by the public sector such as in infrastructure, land-use and recreational projects. There is a small, but growing level of activity by nature-based enterprises i.e. SMEs and non-profits providing products and services across all three types of NBS.

Nature-based **decision-making** is occurring at multiple levels, with local consultation and business / community engagement around specific project opportunities; regional and national programmes to raise awareness of climate change and biodiversity loss and encourage innovation in NBS; associations, networks and consultancies defining best practices and global frameworks for NBS valuations being developed and promoted by research institutes, philanthropic organisations and international agencies.

2.3 Valuing Nature

The consideration of the values generated by ecosystem services and the losses connected to

ecosystem degradation is essential to make policy and production/consumption choices in coherence with sustainable development (Dasgupta, 2021). The concept of value linked to nature and NBS is multi-faceted since it comprises different types of benefits. These benefits are perceived by different stakeholders and they are delivered over different periods of time. Therefore, the assessment and evaluation of the value created by NBS is a complex task (Crocchi and Lucchitta, *forthcoming*). In fact, the variety of services provided by ecosystem services contribute directly (e.g. food production) or indirectly (e.g. pollination) to human well-being through a cascade model described in Figure 2.2.

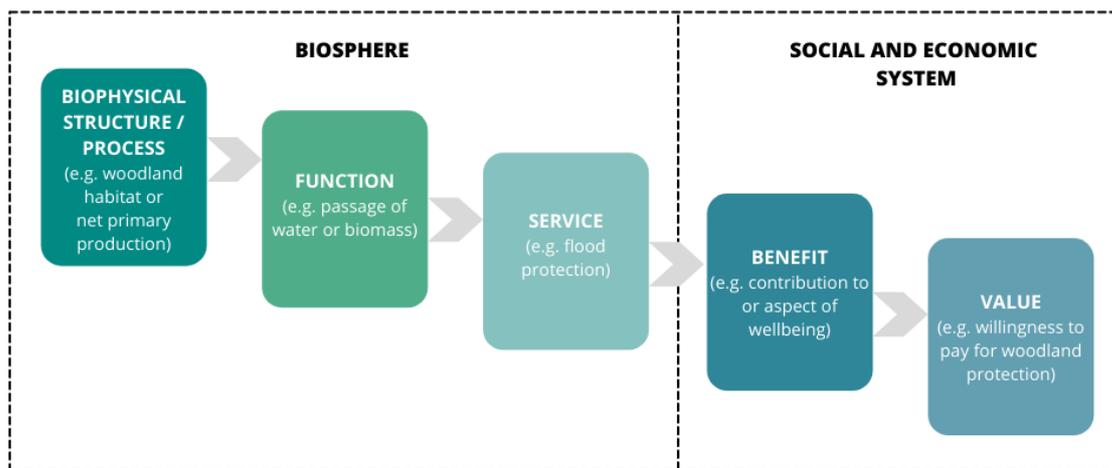


Figure 2.2: Ecosystem Service cascade model
(Crocchi and Lucchitta, *forthcoming*)

The capacity to benefit from value generated by NBS through market transactions or policy instruments is defined as “value capture”. Based on economic theory on the classification of goods (Ostrom, 1990) four categories of goods can be individuated: private goods, public goods, toll goods and common pool resources. NBS and the ecosystem services they provide sometimes show characteristics of public goods or common pool resources and therefore can generate market failures or lead to absence of markets, since the price mechanism does not guarantee an optimal level of their production and allocation. In order to correct market failures in the case of public goods a solution can be the intervention of the state in their production and management, through fiscal instruments (general or specific purpose) (Crocchi and Lucchitta, *forthcoming*). In the case of common pool resources, a solution can be the introduction of governance tools to regulate use through an institutional framework. In this way the public sector can introduce policy instruments aimed at internalising positive externalities and capturing the value generated by NBS which are not reflected by market prices. The methodologies for ecosystem services valuation can be divided into three categories that are listed in Table 2.1, of which the most common are hedonic prices, stated preferences, and contingent evaluation (OECD, 2018).

Table 2.1: list of the available methodologies for the economic valuation of ecosystem services (King & Mazotta, 2001; Wilson & Carpenter, 1999; de Groot et al., 2006)

Category	Valuation methodologies
Direct market valuation - use of data from real markets, which reflect actual preferences or costs for individuals	Market prices Replacement costs & damage and cost avoided Production function approaches
Revealed preferences - based on the observation of individual choices in existing markets, in this case, it is said that economic agents "reveal" their preferences through options	Travel costs and hedonic prices
Stated preferences - simulation of the market and demand for ecosystem services using surveys on hypothetical variations used to estimate both the value of use and non-use	Contingent valuation Choice modelling Deliberative monetary valuation Questionnaire In-depth interview Focus group Citizens' juries Health-based valuation method, Q-Methodology

Another approach to valuing nature which is gaining much traction at the moment is the capitals approach. The broad message of the capitals approach is that to know if a NBS is cost-effective, efficient or beneficial to the alternative (grey infrastructure), you have to be able to measure the value that would be created or eroded for different stakeholders under different options. A capitals approach is the framework that allows you to understand if NBS are really generating value across multiple scopes. The 'flow' of natural capital through the Nature-based Economy via NBS is presented in Figure 2.3.

The 'Natural Capitals' approach not only provides a way to 'value' nature and express and measure the impact of NBS on nature – it also *“moves beyond considering only how we impact on the [natural] capitals to highlight how we depend on them. This shift in mindset contextualizes our relationships with [natural] capitals and helps to illustrate a clear business case for their protection and investment in their health and resilience.”* (Capitals Coalition, 2021) In this approach we see an attempt to shift cultural understanding and norms concerning people's relationship with nature with the aim of influencing 'decision-making' in both consumption and production.

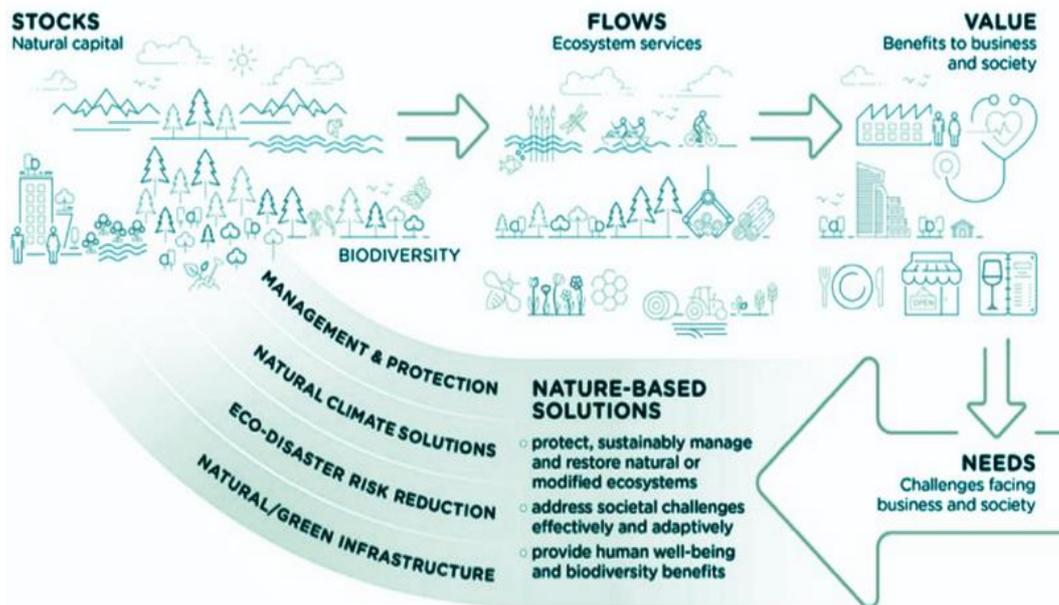


Figure 2.3: Visualising the flow of Natural Capital via Nature-Based Solutions
(Adapted from Capitals Coalition⁵ and We Value Nature)

The Natural Capital protocol (2021) provides clear and practical steps to valuing nature both as a factor of production of goods and services and as an outcome of the production, consumption and decision-making activities in the Nature-based Economy. Furthermore, the natural capitals approach can help stimulate and accelerate investment in NBS and large-scale Nature-Based Enterprises through providing transparent indicators of cost-benefit and return on investment in nature⁶.

2.4 The NBS Value Chain

A **value chain** is “the full range of activities which are required to bring a product or service from conception, through the different phases of production [...], delivery to final consumers, and final disposal after use” (Kaplinisky and Morris, 2001, p. 4). It is therefore broadly consistent with the range of elements in the Nature-based Economy described in Section 1. The processes for designing and implementing NBS value chains are illustrated in Figure 2.4.

⁵ See <https://capitalscoalition.org/>

⁶ See key recommendations and guidance in [Investing in Nature: Financing conservation and NBS](#) aimed at helping projects to access the EIB’s Natural Capital Financing Facility, the Green Climate Fund and/or the Global Environment Facility.

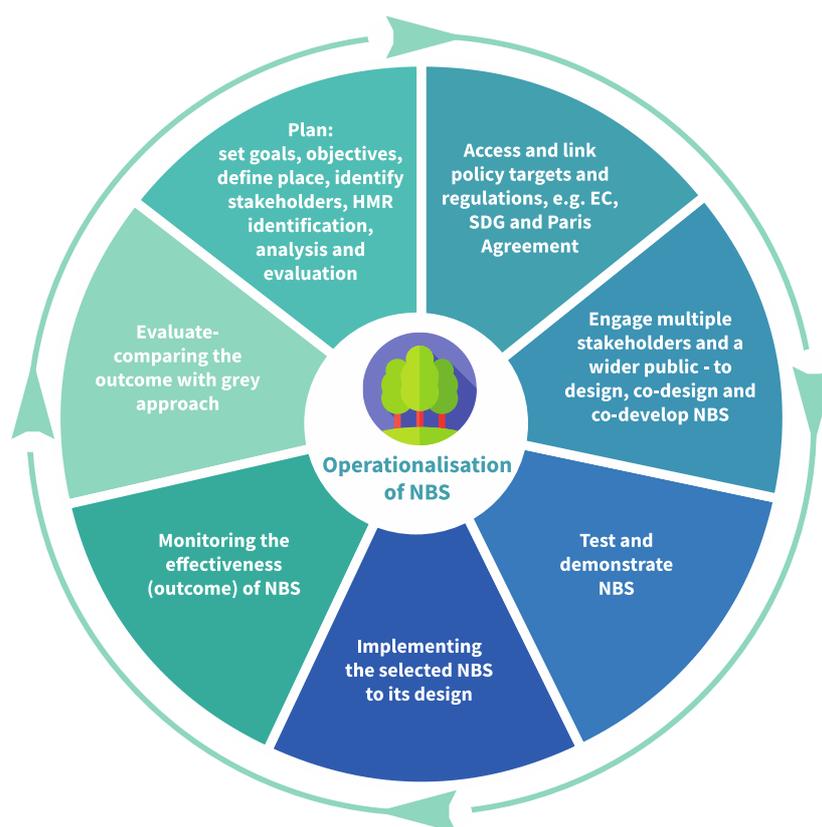


Figure 2.4: Processes for designing and implementing NBS value chains
(Adapted from Kumar et al., 2020)

The ARTISAN Project funded by the EU LIFE programme and conducted by the French Agency for Biodiversity (OFB) undertook a study of the value chains involved in NBS implementation in five different NBS fields: NBS for urban planning (buildings, neighbourhoods, natural parks and water management), living rivers and wetlands, sustainable agriculture, forestry (sustainable management, afforestation and existing ecosystems conservation) and sustainable tourism.

These studies identified a broad range of stakeholders involved across the different phases of design, implementation and operation or stewardship of NBS. Value chains were invariably complex showing different stakeholders involved in different types of NBS and multiple interactions between stakeholders across all value chains.

The ARTISAN study identified a key role for communities/consumers in the design phase of many of the NBS exemplars and there is evidence that private producers can play a key role in NBS implementation – particularly in agriculture and forestry. The complexity of NBS in comparison to conventional economic models depicting linear flows between firms and households is demonstrated across all value chains and illustrated in the case study below supported by Figure 2.6.



Figure 2.5 3D printed reefs providing a structure for plants to grow onto and shelter for fish (Photo credit: Julien Dalle)

Case study of value chain in the water sector: Seaboost

Seaboost is a French company specialized in ecological engineering in aquatic environments. Seaboost's approach involves the introduction of systems that are inspired by nature to reproduce and restore at a large scale aquatic ecosystems in degraded areas or to fight against the effects of climate change.

Seaboost's projects vary from design to delivery of complete projects covering the whole value chain. Their approach is not to implement a project directly, but to provide the tools to do so, to make communities autonomous in the implementation and exploitation of these results. These interventions are commonly funded by public authorities, donors (World Bank), tender opportunities, or private funding (foundation/industry).

When it comes to the value chain, Seaboost's activities often require the establishment of partnerships with multiple actors - local authorities, public institutions, federations/networks/professional unions, companies in the secondary sector (industry, construction and public works), funders and research organizations.

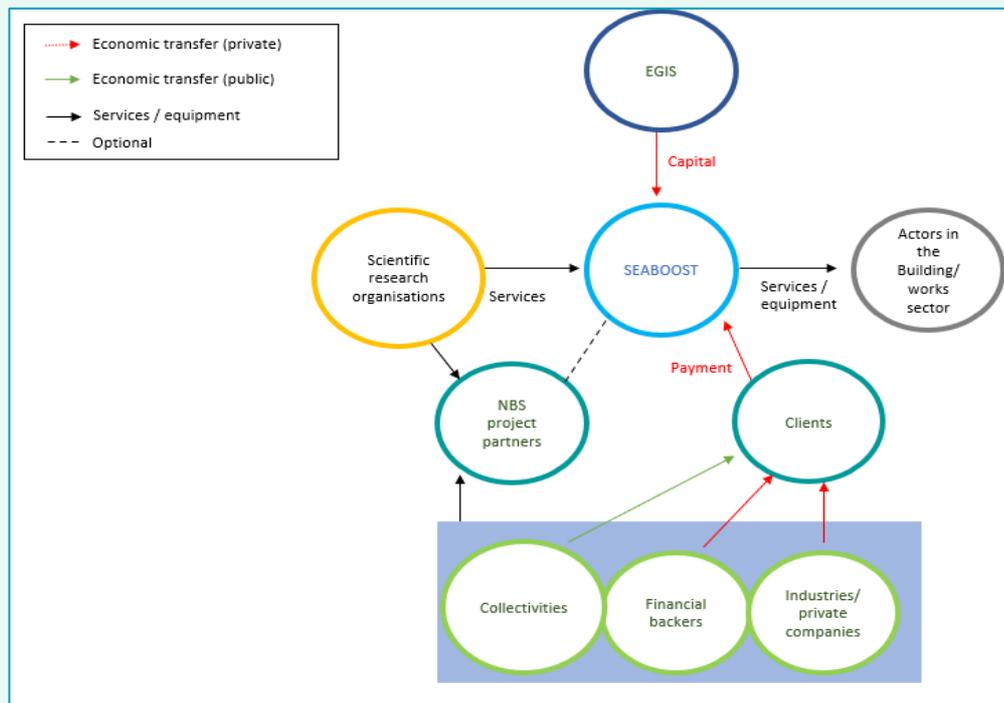


Figure 2.6 Business model environment for Seaboost, with economic interactions among actors

Section 2: Summary

In this section we have positioned NBS within the context of recent reports and policy documents which identifies their role in achieving sustainable economic, social and environmental outcomes in general, and the objectives of the European Green Deal in particular. We consider different approaches to the valuation of nature within the context of a Nature-based Economy and we identify the complexity of stakeholder value chains in the delivery of different types of NBS. We conclude that NBS have the potential to play a significant role in the Nature-based Economy - 'super-charging' the transition to sustainable development de-coupled from resource utilisation and carbon emission growth. To deliver on this potential we need to consider how to secure active and ongoing participation from stakeholders across all sectors of the economy in an approach where parties have a full understanding of the value of nature as both an input and output in economic processes.

Section 3 - The Market for Nature-based Solutions

In Section 3, we present an overview of the market for NBS including key challenges and enablers to market development and we consider market forces of supply and demand. The concept of nature-based enterprises (NBEs) is identified as a key enabler of market supply to meet increasing market demand and provide additional vehicles for private sector investment.

3.1 Overview of the market for NBS

NBS are generating significant interest worldwide thanks to global and EU wide efforts to raise awareness of the multiple benefits that NBS offer. The European Union, through the EU Biodiversity Strategy 2030, has called on cities with over 20,000 inhabitants to develop Urban Greening Plans (European Commission, 2021). Thanks to these efforts government stakeholders, academia, the business community, citizens and other actors are increasingly recognizing and embracing NBS (Wild et al., 2020). The Urban Nature Atlas⁷ already includes 1000+ examples of NBS from 100+ EU cities, and the amount of projects added have been steadily increasing from 1990 – 2016, indicated an increase in demand for NBS (Figure 3.1)

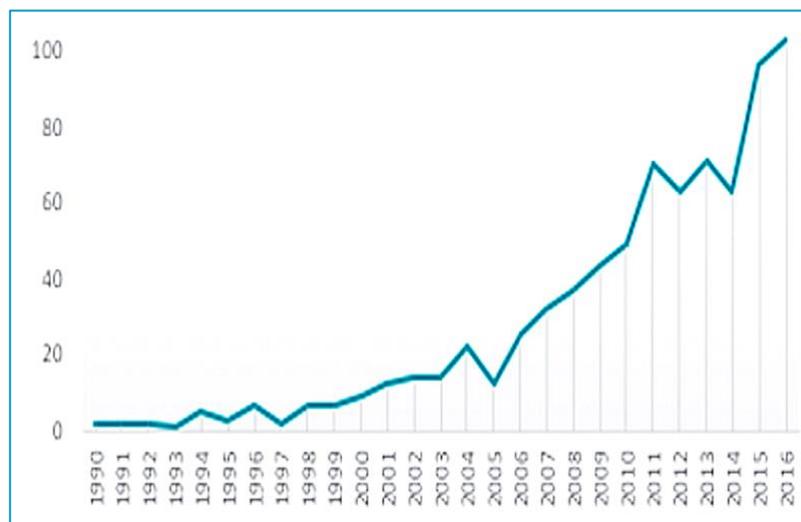


Figure 3.1 Number of NBS per starting year in the Urban Nature Atlas (1990-2016)

The European Union considers NBS as an opportunity to foster innovation and competitiveness, both in domestic and international markets (European Commission, 2015). In its [Biodiversity Strategy for 2030](#), the European Commission states that industry and business have an impact on nature, but are also key in developing innovations, partnerships and expertise for tackling biodiversity loss and restoring ecosystems. This will require significant public and private investments at national and European level. NBS are key to

⁷ See Urban Nature Atlas at <https://una.city/>

innovation for economic or societal needs that rely on nature, and the up-take of NBS leads to business and employment opportunities in a wide variety of sectors.

Woodruff (2019) highlights the potential for a new NBS market based on increased supply and demand. Innovative companies and organizations are emerging because of the increased awareness of sustainability or the 'nature trend', while already established companies are gaining new momentum. McQuaid and Kooijman (2020) find that while awareness and policy are fuelling increased demand for NBS, there is uncertainty if the supply side can meet these demands in the short term. Specialized companies for implementing NBS are often hard to find with recent reports indicating the challenges many cities face in finding skilled suppliers of NBS (Maciulyte and Durieux, 2020).

NBS are in the early stages of market development and product diffusion and therefore are likely to have significant room to expand demand. Figure 3.2 shows the stages of adoption and demand development in the diffusion of innovations. Nature-based solutions are generally new approaches to societal challenges, and products and services related to NBS are still in the early stages of adoption and demand development.

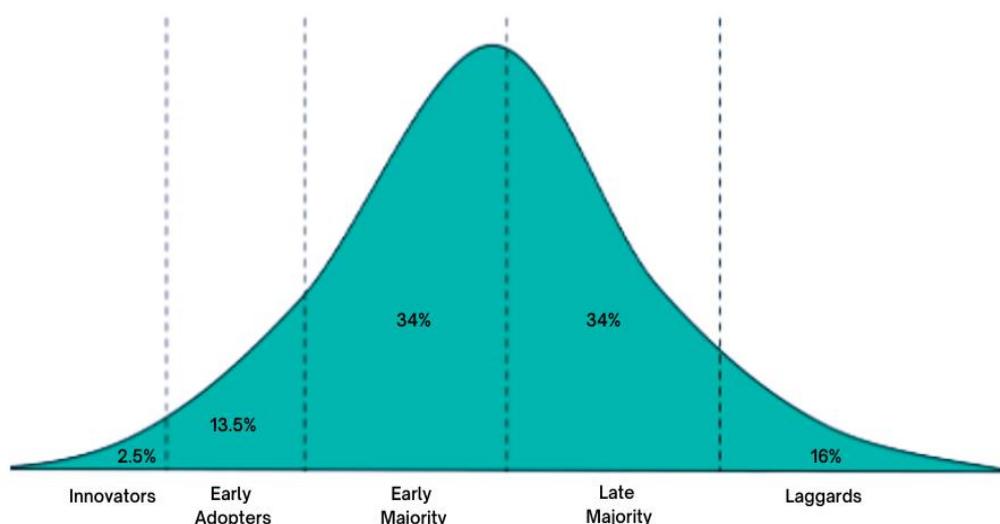


Figure 3.2 Stages of adoption and demand development in the diffusion of innovations (Rogers, 1962)

Economic activities

Within the Nature-based Economy, recent research on the supply side has identified 11 economic sectors where the private sector are key actors in the supply of NBS (Table 3.2).

Table 3.2 Economic categories where private sector actors are engaged (Kooijman et al., 2021)

Economic category	Sub-categories
Ecosystem creation, restoration and management	Ecological & landscape restoration Ecosystem conservation and management Biodiversity conservation Reforestation Marine and freshwater ecosystem restoration Marine and freshwater ecosystem conservation and management
NBS for green buildings	Living green roofs and facades Living green wall indoor Living green walls outdoor
NBS for public and urban spaces	Green areas, parks and gardens Green infrastructure Green space management Urban forestry Urban regeneration projects
NBS for water management and treatment	Natural flood & surface water management Urban green and blue infrastructure Urban water management Wastewater management
Sustainable agriculture & food production	Agroforestry Beekeeping Horticulture Plant and soil improvement Regenerative farming
Sustainable forestry and biomaterials	Sustainable forestry Biomaterials for construction Biomaterials for food preservation
Sustainable tourism and health & wellbeing	NBS for health & wellbeing Agritourism Eco-tourism and nature-based tourism Forestry tourism
Advisory services	Biodiversity and ecosystems Urban greening design & planning Landscape architecture Water management Community engagement for NBS
Education, research & innovation activities	Ecological research Environmental awareness education Research & innovation projects Vocational & skills training
Financial services	Carbon offsetting Investment for biodiversity and conservation Natural capital accounting
Smart technology, monitoring and assessment of NBS	Smart technology solutions for NBS Environmental monitoring Spatial tools for environment

Some NBS-market segments or niches have been present in the market for years. These robust NBS-market segments and industries include green buildings, water management, landscape architecture, urban and environmental planning, forestry (urban forestry) and agriculture (urban gardening) (Casparij Kondrup et al., *forthcoming*). Market analyses at individual country level shows growth in all of these sectors. E.g. in the Czech Republic, the area of green roofs increased by more than 25% from 195.000m² in 2017 to 247.000m² in 2018 with a parallel increase in industry turnover (European Federation of Green Roofs and Walls, 2021). In Austria, significant market growth is also foreseen. The current green roofs and walls industry consists of 550 companies with 1.200 employees in the direct value chain, that obtained a total turnover of 90,5 million Euros in 2018. The compound annual growth rate for the green roof sector in Austria between 2014 and 2018 was 9 % (GRÜNSTATTGRAU, 2020).



Case study from Austria:
A message from Leonore Gewessler, Austria's Federal Minister for Climate Action, Environment, Energy, Mobility, Innovation and Technology on the potential of the green buildings market.
"The increasing trend towards greening buildings is becoming a necessity due to the climate crisis, in order to make cities climate-neutral and more liveable.

Currently, one in every ten flat roofs in Austria is built as a green roof. We know that for every 8,000 square meters of green roofs, 10 new jobs are created. If every second new roof were built as a green roof until 2030, more than 33,000 jobs would be created.

With targeted measures, policy goals in the health, financial, energy and environmental sectors could be combined and thus lead to a more effective economy. Intensive cooperation between policy, research, and the energy, construction and urban greening sectors is necessary to make climate protection accessible to everyone in a fair manner."

In contrast, other NBS-market segments such as smart technologies for NBS or NBS for health and well-being appear to be still in the early stages of market development (Kooijman et al., 2021). A major challenge in estimating market potential is the lack of national and EU wide data and market analysis on emerging market sectors and limited data availability on more mature markets. This lack of market information could inhibit investment interest in emerging market sectors in particular (Casparij Kondrup et al., *forthcoming*).

Factors influencing NBS market development

A PESTELE (Political, Economic, Social, Technological, Environmental, Legal and Ethical) analysis of the macro-environmental factors impacting NBS market development reveals important insights to be considered as part of policy development:

Political: NBS have been successfully identified as an important policy instrument in the fight against climate change and biodiversity loss. However, in policy arenas such as health or economic development, the potential benefits of NBS have been less well recognised and considered in policy agendas. This has potentially contributed to lower market demand and the availability of financing. There is an urgent need to integrate NBS into policy goals related to health, economic development, finance, energy and construction in order to realise the full potential of NBS from a societal and economic perspective.

Economic: the lack of a clear and consistent valuation of natural capital across the public, private and third sectors has been identified in Section 1 as a major challenge to the development of the Nature-based Economy and consequently the development of a well-functioning market for NBS. The clear quantification and monetisation of benefits for NBS is key for the development of attractive business models and cases (Wild et al., 2020).

Social: The potential impact of NBS on society is a major market driver. In line with the UN SDGs, NBS can help to address water and food scarcity on land and through coastal marine NBS. In cities, NBS have been shown to generate a positive impacts on health and wellbeing, an impact further highlighted during the COVID-19 pandemic. A major challenge to realising NBS potential is governance and financing. The identification and inclusion of stakeholders, the definition and selection of the right governance and related finance structure have a strong effect on the success and spread of NBS. Successful NBS will need collaboration at multiple levels of governance (from local, regional, national to international) and institutions to align the interests of multiple sectors and to take into account cultural narratives which may involve both positive and negative perceptions of nature. Public perceptions and prejudices also need to be taken into account. Studies show that uptake of green buildings can be hindered by public concerns about insects, leaks, costs etc.

Technical/Technological: From a technical perspective, an important challenge is keeping abreast of industry best practice and long term maintenance. Variable quality standards can lead to loss of buyer confidence. Standards and best practice have been identified as possible solutions.

From a technology perspective two factors have been identified as important in relation to the NBS market. As an overall market driver, digital communication and platforms have been identified across many market sectors as presenting significant potential for enhancing demand through network effects and efficiencies. Platforms such as the [Connecting Nature](#)

[Enterprise Platform](#) present much potential to connect different stakeholders across complex NBS value chains in particular in emerging market sectors. At the level of individual market sectors, smart technology applications to nature are an emerging market sector.

Environment: Climate change and biodiversity loss are key drivers of demand for NBS but uncertainty around changing climate change conditions and challenges measuring the impact of NBS, both positive and negative, have been identified as a barrier.

Legal: Legal factors impacting on NBS can be considered at multiple levels. At the highest level, international agreements on caps on carbon emissions prompt national and regional legislation which in turn leads to increased market demands for NBS with a proven capacity to contribute to mitigating against carbon emissions. At a local level however, planning legislation designed for conventional grey infrastructure, related to land development and building development may sometimes present challenges to NBS market demand. The development of standards and impact indicators related to NBS design and implementation may help to address planning issues.

Ethical: Much attention has been focused on questions of social justice and equitable access to nature-based solutions with critics pointing to negative social impacts arising from gentrification. Stakeholder engagement and inclusive governance are essential criteria in policy development to ensure ethical market development in line with the just transition aspirations of the EU Green Deal.

3.2 Understanding demand of Nature-Based Solutions

NBS present many challenges for traditional policy-making in relation to demand. The extent to which there is demand for, e.g., the public space, amenities, climate mitigation & adaptation, support of wellness, or other kinds of functionality generated by NBS, is a complex and insufficiently explored subject. Yet, the outcome is bound to have a strong bearing on the willingness of policy makers, market actors and civil society to invest in and develop NBS. It is also interwoven with the degree to which NBS are put to use and accompanied by innovation and the rise of commercial enterprises capable of sustainable business operations, or able to sustain social innovations and not-for-profit activities in support of wider social goods.

As a key consideration, NBS are associated with co-benefits for biodiversity and human well-being which, in fact, are intrinsically interlinked with participatory processes and the way they are put to use. Capturing these dynamics goes beyond single indicators, individual ecosystem services (Mouchet et al., 2017), or traditional cost-benefit analysis (Ürge-Vorsatz et al., 2014). In many respects, effective user participation in NBS coupled with the impetus of

diverse other sources of demand will be crucial for determining the resulting benefits and long-term value generation. Yet, little effort has been made to date, to arrive at operational guidance for policy, what measures are warranted to spur the demand for NBS, and what criteria to apply in this regard.

Types of Demand

The basic demand for NBS themselves may emanate from several directions:

- Policymakers, public managers and experts observe their potential benefits, for the urban environment, health and social wellbeing, economically and socially, as well as for the environment and ecology.
- Private firms, developers, entrepreneurs and financiers who discern economic gains and development opportunities.
- Citizens and representatives of the “third sector” (non-profits, community groups, charities) that perceive opportunities to address local problems and opportunities for new initiatives and the realisation of new assets, such as public space and engagement in meaningful activities.

At the same time, the realisation of valuable outputs will depend on the materialisation of demand, again of diverse kinds:

- For the goods and services, including private, marketed products as well as public commons, that result from the NBS.
- Networks, social engagement and social change.

The source and orientations of demand will greatly influence how NBS are devised in the first place, their implementation and use. With respect to types of goods or services, for which demand is expressed differently, distinctions should be made between:

- Private goods or services, which are generally non-rival, excludable, and thus – in principle - priced and traded in markets.
- Public goods or services consumed collectively: transport networks, waste management, health provision, and many others.
- Public goods with large externalities, including the “global commons”, or public space, affect broader categories of citizens and stakeholders. Often, they are associated with cross-border effects, as may apply between neighbourhoods, social classes, sectors, geographical boundaries, etc.

Meanwhile, different actor categories, and sectors, formulate demand differently:

- Public demand; commonly associated with policy decisions, or public procurement.
- Private demand; typically between business and consumers (B2C) or between businesses (B2B).
- Social demand; relates to people's time, and interests, they may invest and engage without spending money. In the case of non-monetary engagement, other opportunities for advancing marketable goods and services may arise (most high-tech providers offer their services for free, while making money at the back-end).

Rationale for demand-oriented policy

The following may provide a rationale for policy directed at the demand for NBS:

1. **Enhanced Relevance:** As a means to enable increased participation in support of enhanced relevance of NBS.
2. **Increased Systems Efficiency:** In order to strengthen presence of synergies between complementary value-enhancing elements, coordinating actions or factors that may otherwise appear separated and unrelated.⁸
3. **Achieving Positive Returns:** Pursue a portfolio of measures which result in a positive socio-economic rate of return overall, outweighing the costs of pursuing the measures.⁹
4. **Creating a 'pull' dynamic** in the Nature-based Economy through generating returns sufficient to attract private entrepreneurs and investors.

3.3 Understanding supply of Nature-Based Solutions

Much of the literature on NBS to date has focused on the public sector as a lead stakeholder - from the perspective of demand and from the perspective of supply. In comparison, significantly less research has looked at the role of the private sector in the implementation of NBS - from the perspective of demand (levels of awareness of NBS in the private sector and factors driving demand such as natural capital approaches), and from the perspective of supply (role of private sector in the supply chain of NBS, challenges faced and solutions emerging). In this section, we provide a contextual overview of supply side issues in the public sector before presenting findings from recent studies of organisations in the private sector who play an important role in the supply of NBS.

⁸ Compared with the concept of "systemic failure" as a rationale for policy, besides market and policy failure, in the literature on innovation systems (Lundvall, 1992).

⁹ Showing up in a positive net social rate of return in the aggregate, to the extent that it can be calculated.

As a general rule, NBS are complex and supply-side relationships cannot be easily defined in terms of ‘buyer-supplier’ relationships between the public and private sector or between the private sector and consumers. The implementation of NBS involves an interconnected web of value-chain actors. The actors involved may differ depending on the type of NBS, level of maturity and phase of development. The boundaries between demand and supply may also overlap. End-users such as communities and businesses may also be suppliers of services (e.g. volunteers supplying maintenance or monitoring services) and suppliers of financing (e.g. through crowd-funding or corporate sponsorship). In understanding demand, NBS suppliers need to involve end-users at early planning stages to establish user needs. This co-production process involving multiple stakeholders may be compared to an open innovation process involving the wider innovation ecosystem and opening up potential for new innovations.

Nature-based enterprises (NBEs): key actors in the supply chain of NBS

“The Recovery Plan and the wall of investment which is coming – the largest since the Marshall Plan – will be looking at the geography, economy and society of the future and at new businesses, value chains, innovations and platforms. Nature-based enterprises can offer really significant potential to deliver on the ambitions of the Green Deal and indeed the EU Recovery Plan.”

John Bell, Director, Healthy Planet, European Commission¹⁰

Research by Kooijman et al. (2021) found that NBS are delivered by different types of organisations, including enterprises. Nature-based enterprises (NBEs) are for-profit or non-profit companies, organizations or initiatives engaged in economic activity that contribute to the development and delivery of NBS. Nature-based enterprises may use nature either directly, or indirectly. Nature may be used directly by growing, harnessing, harvesting or restoring natural resources in a sustainable way and/or indirectly by contributing to the planning, delivery or stewardship of sustainable NBS.

Characteristics of Nature-Based Enterprises

The findings in this section are drawn from Connecting Nature research¹¹ (Kooijman et al. (2021); McQuaid et al., *forthcoming*) and REGREEN research (Casparij Kondrup et al., *forthcoming*).

- **Size:** Most NBEs fit the EC classification of a micro-enterprise. In comparison with the EU average where 93% of SMEs are micro and 5% are small, research findings show

¹⁰ Speaking at the launch of the Connecting Nature Enterprise Platform, October 21st 2020.

¹¹ Connecting Nature research study (2020): the aim of the study was to identify private sector agents involved in the delivery of NBS. Based on the evaluation of 174 data points from a systematic review of academic literature (26) and an enterprise survey (148), a typology of organisations delivering NBS and a categorisation of their economic activities was proposed. A follow up study (McQuaid et al, *forthcoming*) aimed at better understanding characteristics, barriers and enablers drew on additional survey data (148 enterprise) and follow up interviews with 22 NBE founders.

that 76% of NBEs fall into the category of micro and 21% into the category of small enterprises.

- **Age and stage of development:** Nature-based enterprises are not a new phenomena with research indicating that a number of nature-based enterprises have been active for more than 20 years. It is evident however from Connecting Nature and REGREEN research that the number of new enterprises starting up in this sector is increasing significantly in recent years. Most nature-based enterprises identify themselves as in a growth stage of development indicating potential for further development.

Challenges faced by nature-based enterprises

The most frequent challenges identified by NBEs included:

- The lack of consistency in public policies towards nature-based solutions. For example while nature-based solutions were often endorsed in climate policy, in other policy areas such as planning, building regulations or public procurement, regulations and processes often hindered implementation.
- NBEs noted an increased general awareness of NBS concept among potential buyers in the public and private sector but pointed to a lack of detailed understanding, in particular as regards the cost structure of NBS and the need to budget for long term maintenance costs.
- NBEs identify that in the absence of standards, the quality of NBS implementation may sometimes be variable. Given the early stage of development of NBS, poor quality implementation may lead to wider reputational damage and inhibit future uptake. NBEs recognised the need to raise awareness of best practice and introduce regulations and/or standards related to the delivery of nature-based solutions. Such measures need to be supported by capacity building to address knowledge deficits.
- Another common barrier was that public procurement processes for NBS were not well suited to smaller NBEs. REGREEN research findings showed that larger NBEs were more likely to be involved in public sector NBS contracts.
- Lack of policies to stimulate demand: NBEs considered that in the public sector there was a lack of funding/support for NBS and in the private sector a lack of regulation/incentive to stimulate take-up of NBS.

Organisational challenges faced by nature-based enterprises

- **Financing:** High working capital requirements were identified as a challenge in some industry sectors (e.g. forestry) where capital could be tied up for years. In other industry sectors, the funding needs of NBEs could be considered as volatile based on the project-by-project nature of many NBS contracts. A lack of trust in financial institutions and impact investors was found. NBEs refer to the concerns about the compatibility of their environmental mission with the economic growth criteria required for existing grant financing and for conventional investors.

- **Knowledge / skills gaps:** NBEs identify that local suppliers play a vital role in the delivery of NBS given the spatial and context-specific nature of NBS. They point to widespread knowledge gaps and skill shortages at a local level.

Other skills gaps found were the lack of multidisciplinary skill sets, technology skills and skills in measuring impact. In general, NBEs expressed a strong interest in, and need for, continual professional development. They recognised rapid advances in knowledge in some cases linked to increased investment in NBS research. Overall, NBEs rated access to education, training and skills development as highly important.

Enablers for nature-based enterprises

Strong partnerships or networks were identified as the most significant enabler for NBEs. Networking was seen as important to get in contact with stakeholders and potential new clients (business networks), but also to find partners for projects and funding, to pool competences and share experience (innovation networks). Many NBEs co-operate with research institutions. Universities and other research and development actors are seen as a knowledge base for innovation. Access to independent platforms in order to organize knowledge and join forces was rated as very valuable to NBEs. Some companies are already part of accelerator programs. The [Connecting Nature Enterprise Platform](#) was mentioned as a useful awareness raising platform by those enterprises involved. Social enterprise networks were mentioned as particularly helpful for some businesses providing reassurance as regards mission focus and helping to identify compatible scaling models.

3.4 Public sector challenges in demand and supply of NBS

Historically public sector organisations have played a lead role in the direct financing and implementation of NBS (Sekulova and Anguelovski, 2017) and they continue to play a crucial role today (UNEP, 2021). Collaborative governance approaches, where public sector organisations play an initiating role in bringing other actors together, have been identified as a key success factor for NBS (Frantzeskaki, 2019). The challenges of public sector organisations in implementing NBS are well known (Kabisch et al., 2016, Seddon et al., 2020). and are summarised as follows:

- **Skills and knowledge gaps:** as the public sector have historically been responsible for management of natural resources and urban spaces, they have built up large public sector staff resources with expertise in this field. However, NBS are complex, and constructive processes for their design as well as uptake tend to require transformative change guided by multidisciplinary skill sets. In the presence of established corporatist structures, such processes are regularly resisted by incumbent actors and competencies (Andersson et al., 2009). Meanwhile, public sector budget shortages and recruitment freezes have limited the opportunity for many public sector organisations to recruit NBS specialists. When the lack of inhouse capacity is combined with public

procurement challenges inhibiting the engagement of external expertise, this knowledge block leads to an increased risk of a negative outcomes cycle. Sub-optimal implementation of NBS will lead to limited effectiveness of NBS which in turn will lead to lack of support for further investment.

- **Measuring effectiveness:** to date a lack of knowledge and skills on how to measure the effectiveness of NBS has been a major challenge increasing the perception of higher risks related to NBS and hampering larger scale implementation. The recent publication of an EC Handbook on Indicators (Wendling and Dumitru, 2021) will help to address this issue but will need to be accompanied by technical support tools, on the ground training and skills development measures.
- **Long term sustainability and governance models:** much of the focus of public sector attention to date has been on securing financing for up-front investment in NBS and not on the development of long term business models for NBS built on principles of co-governance. Inclusive governance is enshrined as one of the fundamental criteria of the IUCN Global Standard for NBS but Connecting Nature research shows considerable knowledge gaps remain in cities as regards the development of inclusive governance models engaging citizens and local businesses in the planning and stewardship of NBS.
- **Poorly suited processes:** many processes in the public sector have been designed for conventional 'grey' infrastructure solutions and are not well suited to the implementation of NBS. This is particularly evident in reports on the inadequacy of public procurement processes which are not well suited to the complexity of NBS.
- **Market failures - difficulty finding external suppliers:** while inadequate public procurement processes are often cited as a reason for the difficulty in finding external suppliers, the reality may be more complex. NBS is a new area experiencing rapidly growing demand. Little effort has been invested to date in understanding or cultivating the supply of solutions from the private sector. As a result there is a shortage of supply in general with many NBEs reporting significant increases in demand. As NBS are context specific i.e. they need to be designed taking into account local needs and maintained, usually by local suppliers, urgent measures are required at local government level to stimulate the emergence of skilled suppliers to meet future increases in demand. Coordination of skill and capacity development support policies and programmes is needed at national and EU level.

Section 3: Summary

In this section we present an overview of the market for NBS including key challenges and enablers to market development and we consider in-depth market forces of supply and demand. Despite the lack of market data, we identify clear patterns of growth in established NBS market sectors such as green buildings and we identify the emergence of promising new sectors such as smart-tech for NBS and NBS for health and well-being. We review macro-environmental factors influencing overall market growth which include policy supports, economic valuation of NBS, technological drivers, inclusive governance and increased awareness of social justice aspects of NBS development.

From a policy perspective, stimulating demand and supply is not a simple proposition. A multiplicity of actors are involved in both demand and supply of NBS with varying roles in different market sectors. Participatory processes and effective user participation are an essential starting point for consideration in any policies to stimulate market demand. Demand-led policies must take into account the nature of NBS as private goods and services (e.g. green buildings), public goods or services which can be enjoyed by many (e.g. parks) and so-called common pool resources i.e. public goods where over-use of such resources would lead to negative effects (e.g. urban forests or nature reserves). This section identifies that the market for NBS is at an early stage of development with much potential for growth.

Section 3 reviews results of recent research looking at suppliers of NBS from the private sector or 'nature-based enterprises'. The characteristics of nature-based enterprises are profiled in terms of size, stage of development, challenges and enablers. Findings suggest that specific policies need to be put in place to support the start-up and growth of nature-based enterprises as a key enabler on the supply side to meet increasing market demand for NBS.

This section concludes with a review of challenges to supply and demand in the public sector. Knowledge gaps are highlighted including ongoing challenges measuring effectiveness, challenges related to hybrid governance and financing and a myriad of challenges related to public procurement which has led to difficulties finding skilled private sector suppliers of NBS.

Section 4 - Introducing a Global Perspective

Section 4 provides a brief introduction to the global perspective on the Nature-based Economy, focusing in particular on NBS and nature-based enterprises.

A number of factors influence how different countries are facilitating elements of the Nature-based Economy through initiatives aimed at developing NBS. These include:

- Inclusion of NBS in global policies leading to global trends towards increased public and private investment in NBS;
- Specific networking / awareness raising / capacity-building activities related to NBS¹²;
- Identification of NBS-related sectors with significant potential to leverage NBS planning and delivery for example, transport, energy and waste in the Caucasus (Tbilisi); energy, ICT-enabled 'smart-water and sewage' (Korea);
- Role of global development agencies to support NBS implementation (for example, the EU Bank for Reconstruction & Development - EBRD, Inter-American Development Bank - BID);
- Reinforcing the need to demonstrate the unique benefits and co-benefits of NBS. There is a lack of awareness amongst policy makers and the industry sector in various international locations (for example in China, Brazil, Korea);
- Local governments are often key actors in raising awareness and advocating for investment in NBS in regional / urban contexts;
- Establishment of new partnerships, clusters and networks focused on NBS (e.g. Brazil)

¹² See the activities of the [UrbanByNature Brazilian hub](#) via the H2020 Connecting Nature project

Case study on Nature-Based Enterprises in Brazil

Nature-based entrepreneurship in Brazil has been stimulated through recognition of the important role of the private sector in the financing, implementation and diffusion of nature-based solutions.

A good example is the increased visibility of ‘pocket forests’ in São Paulo. This has attracted a private company to finance the implementation of such a forest in front of its main office building on a very visible avenue on the margins of the Pinheiros River in the metropolis.



Figure 4.1 Pocket forest in São Paulo – before and after planting.

Photo credit: Cardim Paisagismo

Section 4: Summary

In this section a range of initiatives to stimulate global market demand for NBS are briefly introduced. Local governments are identified as a key enabler in this process with regional partnerships playing an important role in knowledge sharing. This section also highlights increased recognition of the role of the private sector and nature-based enterprises in the supply and financing of NBS. The increased availability of international financing for NBS is seen as an enabler to stimulate market demand and growth.

Recommendations

There is no future for 'business as usual'.

Systemic transformation is needed to shift towards the kind of economy envisaged in the European Green Deal where economic growth is decoupled from resource usage, industry is decarbonised and climate neutral and all members of society are engaged in this transition in a fair and equitable way. To achieve this vision, disruptive change is required - change towards a nature-based economy where the value of nature in economic processes is measured, recognised and acted on, where natural resource use and waste is reduced, where intensive efforts are made to restore natural resources, and where the diversity of actors involved in the production and consumption of nature are engaged in decision making that matters.

Systemic transformation takes time however and the latest IPBES report makes it clear that time is running out. That is why nature-based solutions are so important. While not quite the holy grail, we know that nature-based solutions can play a massive role in mitigating against the impacts of climate change and play an immediate role in reversing biodiversity loss. In Europe we have built up considerable knowledge and expertise in how to ramp up NBS at scale. Large scale public investment in NBS, complemented by private and community investment, is imperative in the short term to halt irreversible biodiversity loss. In the longer term systemic change must deliver increased private sector investment. Large scale public investment in NBS can be justified based on a more accurate valuation of return of investment from multiple perspectives, including returns in terms of public health and well-being and economic returns in terms of innovation and job creation.

In a nutshell, NBS have the capacity to 'super-charge' the Nature-based Economy, with the impetus ranging from boosting the restoration of stocks of natural capital through to catalysing the 'production' of nature-based solutions through increased investment in sustainable forestry, nature-based urban regeneration or regenerative agriculture for example. The market for nature-based solutions is growing rapidly, mainly fuelled by increasing public sector demand. While the private sector has an important role to play in the nature-based economy, as consumers of natural resources so far they remain largely unwilling or unable to adequately value and account for these resources in accordance with circular economy principles. On the supply side, the private sector must similarly grow in importance, in terms of the supply of finance for investment and also as direct suppliers of nature-based solutions. Private firms and entrepreneurs supplying nature-based solutions (nature-based enterprises) present a significant opportunity for innovation, enterprise and job creation within the context of a transition to a European Green Deal economy.

To ensure efficient policies towards a nature-positive economy, there is a need for action across multiple levels of government, as well as regional solutions that coordinate across

administrative and sectoral boundaries. In the following section policy measures are proposed at global, EU, national and local government levels. At each level, we recommend systemic measures needed for long-term transformative change, and immediate short-term actions needed to boost the market for nature-based solutions through stimulation of demand and supply.

I. Global level

Major environmental and socio-economic challenges, such as biodiversity, climate change and air pollution, require global treaties (e.g. UNFCCC Paris Agreement, Aichi Targets), goals (e.g. SDGs 8 (8.4), 9 (9.1, 9.3, 9.4 9a), 11 (11.4, 11.6, 11.7), 12, 15) and approaches to meaningfully reduce greenhouse gas emitters or preserve rainforests and green spaces across the globe. The [NBS for Climate Manifesto, UN Climate Action Summit \(2019\)](#) identifies as one of their four priorities: *“Generating the shifts needed in both domestic and international governance and finance to value nature and realize the potential of NBS; ensuring that financial mechanisms are supported with appropriate regulations that are enforced at the national and sub-national levels including promotion and adoption of green supply chains; avoidance of funding for deforestation and other activities that harm ecosystems; increased public and private funding for NBS investment; promoting green finance and innovative incentive measures to promote NBS.”* Complementary to the UN Manifesto, the CBD [zero draft of the post-2020 biodiversity framework](#) (August 2020) calls for nature to be valued (e.g. economic/regulatory incentives positive or neutral for biodiversity), invested in and made transparent, inter alia, through public and private sector financial disclosures.

According to the most recent UN Report on the [State of Finance for Nature](#) (UN, 2021) the level of NBS investment remains a relatively small part of overall climate finance investment. Opportunities to boost investment in NBS such as in post-COVID recovery strategies are being lost. This report shows that public spending on ‘green initiatives’ represented only 2.5% of the post-COVID planning by the world’s 50 largest economies. The UN calls in this report for investments in NBS to triple by 2030 and to increase four-fold by 2050 from the current level if the world is to meet biodiversity, climate change, and land restoration targets at a global level. This report also shows that NBS financing is more dependent on public funds than other types of climate financing investment. Of the USD 133 billion which currently flows into nature-based solutions annually, public funds represent 86% of total investment flows and private finance only 14%. While systemic changes are needed to increase private sector investment, this will take time and the public sector must continue to lead in the near term on NBS investment to avoid catastrophic biodiversity loss and further ecosystem degradation. More than that, there is an urgent need to foster biodiversity net-gain and ecosystem restoration.

5 Systemic Change measures proposed at Global Level:

1. Put in place concrete measures to incorporate the **valuation of nature in both public and private practices** in line with the UN SDGs (part. Goal 8 and 15 and their targets), the post-2020 biodiversity framework as well as the UN NBS for Climate Manifesto (2019). For example, measures (or international standards) to encourage a shift or expansion of the focus from global reporting of GDP to reporting of natural capitals-based indicator(s). The recently published [EC Handbook](#) on evaluating the impact of NBS provides a comprehensive reference point on how to measure different types of impact (Wendling and Dumitru, 2021).
2. Accelerate the activities of international networks, working groups and task-forces towards increasing and **incentivising positive financial flows towards investment in nature** across all governance levels, accompanied by measures to reduce financial flows towards activities harmful to nature.
3. Launch an immediate consultation on how to position “**Nature-based Economy**” concepts and related terms such as “**nature-based enterprises**” in relation to other terms such as “circular bioeconomy”, “bioeconomy”, “nature-positive production”, etc. This needs to be supported by renewed efforts to arrive at a **simple NBS typology** within the wider socio-economic context which is widely accepted. This in turn would facilitate the development of a ‘**common language**’ across policy sectors and monitoring schemes at all levels.
4. Develop a **comprehensive international framework for labelling, tracking, reporting and verifying the state of the Nature-based Economy** to address the difficulty in tracking capital flows and outcomes related to the Nature-based Economy. This could be developed either through existing international frameworks and bodies (e.g. UN conventions) or through international standards applied at local level.
5. Prioritise the creation of international multi-stakeholder databases to increase data availability and **improve decision-making related to the Nature-based Economy** at a global level. This in turn will require significant advancements in the widespread acceptance of operationally useful Key Performance Indicators (KPIs) and SMART targets measuring impact across different valuation criteria (including non-economic) in line with Dasgupta (2021) recommendations on changing measures of economic success. This will help to reduce risk and uncertainty about NBS performance and an enhanced understanding of non-monetary value creation leading to increased investment interest in the public and private sector.

5 Immediate Actions to boost the NBS market:

1. **Sustain measures to keep mainstreaming of NBS to the forefront** of international and national ‘governance, climate action and climate policy-related instruments, including Nationally Determined Contributions, Adaptation Communications, national and regional translations of post-2020 biodiversity framework targets, long-

term low greenhouse gas emission development strategies, spatial planning, national development plans, economic development and business plans' ([NBS for Climate Manifesto, UN Climate Action Summit, 2019](#))

2. Include more specific **recommendations to facilitate investments in nature-based solutions in real terms** in global policies if the world is to meet biodiversity, climate change, and land restoration targets. In the immediate short term, the public sector should be encouraged and supported through economic and regulatory incentives to sustain and increase investment in NBS while in parallel, the international community puts in place systemic changes to incentivise increased private sector interest and investments.
3. Agree a formalised strategic plan at the global level to introduce a **cross-cutting modality of investment for nature-based solutions** across policy sectors and initiatives, effectively creating an asset class for NBS.
4. Include significantly **increased financing for NBS in post-COVID economic recovery packages** in support of human and environmental health, improvement of quality of life and creation of new green jobs.
5. Ensure that increased investment in NBS is accompanied by **capacity building measures and programmes to stimulate private sector supply of NBS** (nature-based enterprises) leading to innovation, job and enterprise creation in global economies. Develop international standards to support market development based on reliable quality standards including criteria, technical specifications and definitions.

II. EU level

Whilst NBS are considered in the European Green Deal itself and supporting policies such as the Biodiversity Strategy 2030, the Adaptation Strategy, the new Forest Strategy, and most likely, the upcoming Soil Strategy, their potential is not sufficiently recognised in non-environmental policies, let alone funding and investment programmes. At EU level important first steps have been taken to align investment with the sustainability goals of the European Green Deal. In April 2021 the European Commission adopted a package of measures to help improve the flow of money towards sustainable activities across the European Union in support of the European Green Deal. The communication "[Directing Finance Towards the European Green Deal](#)" (2021) presents various approaches including the [EU Taxonomy Climate Delegated Act](#) ("ETCDA"), a [proposal for a Corporate Sustainability Reporting Directive](#) ("CSRD"), a revision of the [Non-Financial Reporting Directive](#) ("NFR Directive") and other amendments related to insurance and investment.

The [EU Circular Economy Action Plan](#) which is identified as a key building block of the European Green Deal foresees a further range of specific measures in support of circular

economy activities. These include the use of EU financial instruments such as SME guarantees in order to mobilise private financing in support of the circular economy and specific business-led initiatives to develop environmental accounting principles that complement financial data with circular economy performance data and which encourage the integration of sustainability criteria into business strategies. The action plan further encourages the use of well-designed economic instruments, such as environmental taxation and the use of value added tax (VAT) rates at Member State level to be used to promote circular economy activities. While many of these specific measures would be valuable to support investment and use of nature-based solutions, there is no specific mention of NBS in this action plan. This is a missed opportunity to consider not only the importance of resource reduction but also the potential of NBS to contribute to the restoration of stocks of natural resources. Follow-up actions to implement the Circular Economy Action Plan should consider more explicitly the inclusion of complementary NBS measures.

NBS are not considered in any detail either in the updated [Bioeconomy Strategy and Action Plan](#) (2018) where again there is much scope for cross-synergies. Closer alignment with nature-based solutions would contribute to the restoration of natural resources which form the basis of the bioeconomy and could support the emergence of new value chains related to sustainable use of natural resources in fields such as sustainable tourism, NBS for health and well-being, urban NBS etc. Two other important policy areas with much potential for synergies with nature-based solutions are the Farm to Fork Strategy (2020) and the new Common Agricultural Policy (CAP).

While much policy relating to nature has emanated from DG Research and Innovation, DG Environment, DG Clima and to a certain extent DG Regio, it is less clear how policies from DG Grow with responsibility for the Internal Market, Industry, Entrepreneurship and SMEs are aligned. Too few efforts are made to value nature, for instance, or to consider NBS as part of the solutions proposed in the 11 new European Partnerships announced with industry in June 2021 to overcome major climate and sustainability challenges. While the potential of NBS to contribute to innovation, jobs and enterprise creation is only just beginning to emerge, this needs to be reflected in policy alignment and capacity-building supports across a range of EU programmes. Examples include COSME, the European programme for SMEs along with networks such as the Enterprise Europe Network (EEN) and start-up support networks such as the European Business and Innovation Centre Network (EBN). The [EC Intelligent Cities Challenge](#) (2021) supporting the green economy and local green deals is a promising start but lacks a sufficient focus on nature-based solutions and job creation opportunities from private sector suppliers of such solutions.

There is also much potential for further alignment of strategies for NBS market development with regional development policies for smart specialisation and sustainable growth in collaboration with DG Regio and supported by European Structural and Investment Funds.

In summary, a range of further concrete actions are required to improve alignment across EC policies in support of NBS market stimulation.

5 Systemic Change measures proposed at EU level:

1. **Improved policy alignment on Circular Economy and Bioeconomy:** Improved alignment and expansion of policies and initiatives planned to support the Circular Economy and Bioeconomy to specifically include measures to stimulate the NBS market. This includes support for increased business awareness, engagement and uptake of nature-based solutions and the availability of financing instruments for investment in private sector nature-based enterprises supplying nature-based solutions. Further clarification is needed of the role of nature-based solutions in the Farm to Fork Strategy and CAP reform planning through engagement with communities and end users of nature-based solutions in decision making processes.

Increased alignment of Regional policy and Enterprise policy: A specific task-force should be set up involving DG Research & Innovation, DG Environment, DG Grow, DG Regio and external experts as well as SMEs, for the purpose of proposing policies and initiatives to stimulate private sector demand and supply of nature-based solutions.

EU Taxonomy for Sustainable Activities: Continuous collaboration with the EU Taxonomy for Sustainable Activities, as part of the EU Sustainable Finance Strategy, is essential to help plan and report on the transition towards a nature-based economy consistent with the EU Green Deal and the European Green Deal Investment Plan (EGDIP). NBS need to be more specifically included in the EU Taxonomy.
2. Investment in EU wide **research/market studies** on the positioning and potential synergies between Nature-based Economy principles and other strategies and action plans identified to achieve the aspirations of the Green Deal including the EU Sustainable Finance Taxonomy. Specific studies should be funded on NBS as a ‘supercharger’ of the Nature-based Economy looking at the potential of different NBS market sectors for innovation, enterprise and job creation in individual NBS market sectors.
3. Put in place **EU measures to stimulate the development of NBS market sectors** taking into account NBS market characteristics (varying levels of market maturity) and challenges faced at market level (need for networking due to market fragmentation and early stage of development). EU funding should be put in place to pilot the development of specific market sectors in collaboration with industry stakeholders, end-users in the public and private sector and the innovation ecosystem at local and national level.
4. **Embed multiple actors in decision-making processes on NBS at EU level.** The EU needs to lead by example as regards the engagement of multiple actors in setting

policies with regard to nature-based solutions. This is a core principle of the Nature-based Economy.

5. **Increase actions aimed at much higher levels of corporate and SME valuation of nature:** Existing actions targeting improved corporate ESG reporting should be extended to include direct reporting on natural capital. Additional policies and actions are needed at SME level to raise awareness of the importance of valuing nature and to put in place appropriate measures to change behaviour without placing additional onerous reporting burdens on SMEs. Corporates and SMEs need to be involved in decision-making about such measures (see point 4).

5 Immediate Actions to boost the NBS market:

1. **Triple EU investment in NBS by 2030 and quadruple it by 2050** in line with the recommendations of the UN Report on the [State of Finance for Nature](#) (2021). Engage InvestEU, the EIB and the EIF in providing this financing. Investment should be aligned with actions tackling remaining roadblocks such as transformative change requirements at local government level. Examples of potential pilots and investments include:
 - a. Novel approaches to cross-departmental and cross-agency collaboration on joint NBS policy development at local government, national and cross-border level;
 - b. New forms of governance at local government level such as a transition from vertical departmental level responsibility for NBS to horizontal governance approaches, for example, through piloting cross-departmental NBS task forces in city/regional governments chaired by Mayor and resourced from departmental budgets;
 - c. New forms of co-governance with community and/or business partners. This may include training and resource measures to support capacity building of citizens, communities and other actors in relation to NBS governance.
 - d. Public procurement is another stubborn challenge where EU support may help in the development and piloting of new practices to address current roadblocks. This is addressed in more detail in the next section on recommendations for local government.
2. **Increase funding for knowledge exchange and collaboration between regions of Europe and the rest of the world**, in particular the Global South. Increased funding through Horizon Europe work programmes to enable cooperation with world regions that have degraded ecosystems due to the supply of nature-based products to more developed economies. RTD outcomes should be more closely aligned with existing support and investment in NBS in developing countries through, for example, programmes such as the Global Climate Change Alliance Plus (GCCA+), an EU

initiative to help vulnerable countries address climate change, largely based on nature-based solutions.

3. **Capacity building to stimulate private sector supply of NBS and investment in NBEs in line with the EU Sustainable Finance Taxonomy.** EU support for capacity-building measures to stimulate the start-up and growth of private sector suppliers of NBS (nature-based enterprises) recognising their individual characteristics (size, early stage of development, mission focus) and the challenges faced at organisational level (specific financing requirements, lack of trust in financial institutions, mismatches with current SME grant criteria, the project-to-project nature of NBS market). EU measures to address skills gaps at organisational level (technology, measuring impact, multidisciplinary skill sets) and across the industry in general (shortage of local expertise, need for continuous professional development (CPD); and support to build networking and partnerships across the innovation ecosystem. EU measures to target investment towards NBEs in line with the EU Sustainable Finance Taxonomy.
4. **Develop standards:** The IUCN Global Standard on NBS provides a helpful self-assessment framework to counter green-washing around the concept of NBS, but more comprehensive standards are needed for different types of NBS to support market development. Standards will provide reassurances for buyers and verification of quality levels to help support and differentiate the offerings of suppliers. We call for EU support for the creation of an industry-led taskforce to consider the best approach to further developing NBS market standards. This may include a range of approaches from increasing awareness of best practice and new technologies among nature-based enterprise suppliers, programmes to build skills and capacities or more formal certification and standards approaches. Significant work has already started - CEN/TC 465 has included NBS in its Scope and Business Plan. Standardisation of NBS could be included in R&I projects (Horizon Europe) as a requirement to close the Research to Innovation to market chain. It is imperative to ensure that standards are co-designed with SME/NBEs to ensure such standards are not disadvantageous to smaller companies and/or do not lead to further exclusion from procurement processes. It is essential to complement supply-side measures with measures to increase 'buyer' awareness of industry standards and best practice.
5. EU/national support for **platforms** (such as the [International Platform on Sustainable Finance](#), IPSF, the [Connecting Nature Enterprise Platform](#)), **networks** (e.g. [Network Nature](#)) and **face-to-face NBS market events** to connect nature-based enterprises with other actors across the supply chain leading to increased innovation and market uptake. Support the organisation of match-making events between businesses and financiers focusing specifically on pro-biodiversity businesses or NBEs. The EU has for example organised similar activities on the Blue Economy a few years ago which have led to a [BlueInvest](#) platform.

III. At national and local government level

National and local governments are key actors in the nature-based economy. The prospect of progress is greater as local governments are closer to citizens compared to national and international policy makers. However, the level of knowledge and integration of NBS into policy and practice at local government level is highly variable. Horizon 2020 investment in innovation actions has supported demonstrations of nature-based solutions in multiple European cities contributing to advancing understanding and uptake of NBS in these cities. However important barriers remain, notably around systemic change. Sustained policy pressure accompanied by investment and support is of high importance. Particular attention should be paid to ways of enabling a shift from existing policies and practices, designed around conventional grey infrastructure solutions, to cross-departmental policies and process change required to achieve the full range of impacts of NBS. Much can be achieved through the rise of integrated, well-functioning healthy interfaces between NBS as green infrastructure – from small scale such as SUDS to large scale such as forests and wetlands – and grey infrastructure sectors, – e.g. infrastructural elements such as roads, pipelines, railroads, buildings, underground and surface canal and cable systems, or logistics hubs – in ways that boost a nature-positive economy, enhancing biodiversity outcomes and reducing GHG emissions, whilst minimising the disruption of urban, peri-urban and rural habitats. Supportive regulation and planning frameworks, along with sound evidence-based policies, are pivotal for a successful transition towards a Nature-based Economy. There is a need to strengthen political and institutional support for NBS, including pushing back against path-dependent practices of spatial planning and financial analyses which tend to favour conventional industry and grey infrastructure.

Processes to capture the value of nature and track changes in value need to be embedded in local government reporting, while underpinned by international standards and policies. The benefits (monetary and non-monetary) of nature over time need to be clearly demonstrated and used to convey the rationale for investment in NBS and help address institutional rigidity and ‘turf mentality’. This is not least important for mobilising budgets in support of sustainability e.g. to support NBS maintenance and/ or the responsibility as well as coordination of maintenance. The development of trusted eco-labels and certification schemes, as well as the and wider acceptance of industry standards, will also help to address residual concerns about quality or effectiveness.

Cross-departmental collaboration on the financing and implementation of NBS to achieve co-benefits in health, wellbeing and economic development remains a stubborn barrier. To realise a systemic shift towards a Nature-based Economy requires increased political awareness and leadership. Urgent actions are needed to review economic policy and strategies at local government level and to consider the transition approaches required. This will require rethinking of long-term economic policies and consideration of new emerging

opportunities in the circular economy, the bio-economy and the nature-based economy. Local green deals are a good start but the opportunities from NBS need to be more explicit.

There is much rhetoric at the moment on increasing private sector investment in NBS. Policy makers need to recognise that while some types of NBS (e.g. sustainable forestry, regenerative agriculture, etc.) are attractive to investors based on conventional economic criteria (scale, return-on-investment, risk), others (e.g. urban parks and gardens) may simply not be based on standard investment criteria. In the first case (eg. forests, agriculture), investor and beneficiary interests are shared from an economic perspective, whereas in the second type of NBS (e.g. urban parks) conventional investor and beneficiary interests are different. This second kind of NBS, not attractive to conventional investors however, are often those that result in the highest returns for society when valued against measures such as contributions to health, well-being and quality of life. Policy makers and investors need to place an equal value on nature as an asset generating these quantifiable outcomes. The recently published [EC Handbook](#) on evaluating the impact of NBS (Wendling and Dumitru, 2021) provides much needed guidance for policy makers and practitioners on how to measure such impacts. In an era when the public sector has unprecedented access to low cost finance, large-scale public investment is needed in NBS. This public investment will reap economic returns in terms of innovation, skills development, enterprise and job creation as well as attractive, high quality environments and good life quality for citizens and employees. In parallel local government policy makers, together with private sector actors, need to consider and then put into place the conditions that will significantly increase private sector investment in NBS.

Systemic changes in decision making processes are needed to accompany the seismic shifts required in local economic policy. Challenges remain in recognising, resourcing and integrating nature-based decision-making activities into NBS design, implementation and governance processes. While significant advances have been made on the introduction of co-creation and co-production activities engaging local communities in co-design processes, knowledge gaps remain around engagement of local business stakeholders. Decision making should engage different actors on the kinds of incentives and supports which would be most effective in increasing and sustaining consumer and business demand for solutions such as sustainable urban drainage systems, green building infrastructure, public gardens and spaces, and biodiversity restoration actions. Increasing awareness through education is an important precursor to creating consumer and business demand.

Further measures are needed to go beyond co-design and co-creation to demonstration of co-governance models. Inclusive governance is one of the key principles of the IUCN Global Standard on NBS. Transition to co-governance models remains a challenge for many local governments, in particular those in the South and East of Europe where policy and processes may be incompatible with network governance models.

Global and EU support will be required to catalyse many of the systemic changes required at local government level.

5 Systemic Change measures proposed at national/local government level:

- 1. Valuation of nature in the public and private sector:** As per recommendations at global and EU level, measures are urgently needed at national/local government level to increase public sector adoption of approaches to capture, account and track the monetary and non-monetary value of nature and nature-based solutions.
- 2. Urgent measures are equally needed at national/local government level to increase an understanding and valuation of nature in the private and third sector** and to encourage private sector investment in nature. Businesses need to be involved in decision making processes about such approaches to ensure they incentivise business buy-in and do not result in onerous additional reporting requirements. Measures to increase the valuation of nature may be aligned with measures to raise awareness and engagement in the circular/bio economy.
- 3. Shift in economics policy in support of Nature-based Economy:** Local government leaders urgently need to set up cross-departmental actions to bring economic policy makers together with those responsible for NBS to consider a long term shift towards the Nature-based Economy. In the short term, economic policy measures should seek to ensure that increased public investment in NBS leads to an increase in innovation and job creation among private sector suppliers of NBS (nature-based enterprises). This will require a shift in public procurement processes towards a more supportive environment for NBS.
- 4. Embedding of participatory decision making processes in policy making:** Leadership is required to embed participatory processes as an essential part of policy making and planning processes related to the Nature-based Economy. While significant advances have been made on community engagement in NBS, increased engagement between local government and local business in exploring the potential of the Nature-based Economy and NBS are needed.
- 5. Deliver seed funding support and capacity building measures to empower local community and third party organisations** to take on an increased role in the co-governance of NBS.

Immediate Actions to boost Demand in the NBS market:

The majority of investment in NBS today is channelled through national or local governments. Alongside EU and international policy makers, it is imperative that local governments sustain and increase public sector investment in NBS in the short-term to address the biodiversity crisis head-on. This will create immediate benefits not just for nature but for the health and wellbeing of society while simultaneously stimulating the emergence of innovation, enterprise and jobs in the supply of NBS in local economies.

10 measures to stimulate demand:

1. **Portfolio approach - rating NBS attractiveness for investors:** We recommend immediate measures to build a portfolio of NBS projects for public and private sector investment at local/national government level. We recommend the potential impacts of NBS projects are valued (monetary/non-monetary) and based on this valuation projects are rated in terms of attractiveness for private sector investors, for public investment and for hybrid investment.
2. **Increase in public sector investment in NBS:** In line with the recommendations of the UN Report on the [State of Finance for Nature](#) (2021) we call for tripling of local government-led investment in NBS by 2030 and quadrupling by 2050. We recommend prioritising investment from the public sector in NBS where private sector investment is not attractive as the primary source of funding. These investments should be aligned with budgets and policies in areas such as health, environment and sustainable economic development.
3. **Public sector investment in novel approaches:** Public sector led investment is also needed for pilots of novel approaches to NBS. These may include emerging technical innovations but also innovations in the form of co-governance and non-public sector led business models in NBS. A fast-track mechanism needs to be developed to update standards with new innovations to accelerate mainstream adoption and implementation.
4. **Specific policy/regulation instruments to stimulate private sector interest** may include:
 - a. Measures to raise the cost of greenhouse gases aligned with European/international strategies and ETS prices. Ring-fencing of taxation revenues for NBS investment at local/national level.
 - b. Reduced taxes for NBS investment in local NBS projects and incentive to support NBS in developing countries. Increased investment may be facilitated through for example an online 'nature-credit' type scheme broadly based on carbon credit approaches. This may lead to increased investment in NBS in the Global South and developing countries to offset local business use of natural resources as part of their value chain.
5. **Increase investor understanding of NBS:** Measures are needed to increase investor understanding of NBS cost structure and business models, including long term maintenance requirements and the benefits of inclusive decision making processes relating to NBS.
6. **Increase local business investment in NBS:** Measures should be put in place to increase awareness and engagement of local businesses with communities and other actors in decision making processes around NBS. Local Green Deals or local

biodiversity contracts could be strengthened as potential vehicles for such collaboration. Studies show that increased engagement has led to local business investment in public NBS through for example Corporate Social Responsibility measures or through use of facilities such as office space/venue hire in public NBS.

- 7. Increase awareness of benefits of NBS from specific NBS such as green (building) infrastructure.** Increase business understanding about cost-efficiencies but also cost structures (maintenance requirements) and standards in particular in urban development/construction sector. Put in place direct incentives to support private sector uptake. Reduce restrictions in terms of construction regulations and policy restrictions. Support market development through platforms and competence centres. See [Gruenstattgrau](#) for good practice at national level on certification, standards and incentives.
- 8. Increase consumer demand:** Put in place measures to increase the level of consumer awareness of the benefits of NBS and the need and opportunities for public, private and consumer investment and engagement. Measures should encourage communal identity to overcome cultural differences, build awareness of environmental issues and offer guidelines for living in harmony with the environment e.g. vegetable gardens, compost toilets, biking, etc. Measures should be accessible and inclusive e.g. technology platforms and social media but also direct outreach, education and engagement activities with groups such as schools, elderly or vulnerable groups.
- 9. Citizen financing:** Put in place measures to facilitate community financing of NBS as part of inclusive approaches to co-governance. See [MyParksScotland](#) for a good practice example.
- 10. Partnerships / platforms / infrastructure:** The public sector can also direct actions to stimulate private demand through for example, fostering public-private partnerships with entities that own land or buildings - enable NGOs to use these facilities for NBS; create platforms for idea exchange, and business growth and resource bundling.

5 measures to stimulate private sector supply of NBS:

New policies are needed to address the emerging shortage of skilled suppliers of NBS from the private sector. Specific measures to support the start-up and growth of nature-based enterprises include:

- 1. Development of individual market sectors:** In tandem with EU measures described in the previous section to better understand and quantify the potential of individual market sectors, at national and local government level measures should be put in place to stimulate market development and address barriers in specific sectors. For example, in the field of sustainable agriculture, measures related to address barriers related to product labelling, geographic scale and digitalisation challenges or in sustainable forestry, the need to increase valuation of other ecosystem services provided by forests

beyond carbon rating and tree planting.

2. **Stimulate the start-up and growth of NBEs:** Financial incentives for nature-based businesses to be created or scaled may require changes to existing instruments and programmes for business support to take into account the specific characteristics of NBEs and measures required to address specific skills gaps.
3. **Standards:** National NBE-led task forces should be created feeding in national perspectives into a European NBE-led taskforce on industry standards. National Mirror Committees organised through National Standardisation Bodies could be used as NBE standardisation task forces. This work should be aligned with the work of the European Committee for Standardization (CEN), Technical Committee 465 on Sustainable Cities and Communities, which has included NBS in its Scope and Business Plan
4. **Networking:** Given the importance of local context at all stages of NBS design, delivery and stewardship, national/local government measures to boost market development could include support measures for platforms, networks and face-to-face industry events to connect nature-based enterprises with other actors across the supply chain leading to increased innovation and market uptake of NBS.
5. **Capacity building:** Collaboration with relevant professional and training bodies to develop training and continuous professional development measures. Incentives for businesses to complete training and continuous professional development. Awards to recognise good practices in implementation of measures to value natural capital conservation and restoration.

5 measures to address public procurement challenges:

1. **Address knowledge gaps:** integrated research and competence development activities to achieve the capacity of government bureaucracy to pursue required coordination and administratively sound management of NBS and participatory processes. This centres on building the capacity to take account of the potential opportunities of NBS, through infrastructure, institutes, or educational institutions, rather than adjusting procurement policy per se. Capacity building measures may address skills and knowledge gaps across different departments about multiple benefits of NBS, increase capacities for monetary/non-monetary valuation of the multiple benefits of NBS, on planning/accounting for the cost structure and value of NBS in particular related to long term maintenance.
2. **Increased valuation of non-monetary benefits of NBS:** Systemic changes are needed to current procurement processes to better align with NBS non-monetary values and cost structures, to measure impact and effectiveness, to manage risk, to make it easier to open up procurement processes to smaller private sector suppliers. Incorporate Natural Capital assessment considerations into public procurement policies – requiring transparency from providers of public goods and services in relation to their

impact on nature.

3. **Changes to procurement processes to accommodate smaller enterprises:** Excessive specific requirements on bidders and lack of trust in the long-term commitment of procurers can be addressed through measures such as smaller pilots, more open-ended and challenge-based criteria opening space for innovation, grouping projects together in support of creative, value-enhancing links between actors at different stages of the value-chain.
4. **Support suppliers:** Increase awareness and recognition of the role of nature-based enterprises (NBE) in the NBS supply chain. Procurement strategies can also be tailored to enable the development of new types of suppliers by providing financial and technical support along with a clear pipeline of deals for innovative start-ups to mature towards trustworthy suppliers.
5. **Strengthen regulatory support for NBS:** Local NBS codes (e.g. building codes for NBS) as well as NBS requirements in procurement processes could be introduced to mobilise investments. NBS standards or other quality assurance mechanisms could be introduced as reference criteria in procurement processes.

Opportunity to harness technology to accelerate market development

One final policy area that merits stand-alone discussion is the potential that digital communications and the platform economy present to accelerate NBS market development. At a platform level technologies facilitate more efficient ways of connecting demand and supply. The [Connecting Nature Enterprise Platform](#) exemplifies an industry-led platform specifically aimed at bringing together buyers and suppliers of NBS. Given the importance of local language and engagement in NBS, there is much potential at national and local level to use platform technologies to stimulate market development.

Similarly, digital enablers can be deployed in support of citizen participation on terms that help frame greater relevance of NBS for resolving outstanding local issues, thus raising their social as well as financial value. Building on Communities of Interest (CoI) in deprived neighborhoods, the URBiNAT project prepares the application of participatory geographical information systems (PGIS) in support of awareness creation and inspiration by targeted citizens in urban farming, locally produced food and enhanced wellbeing.

Technologies such as IoT can play an important role in reducing resource wastage and increasing efficiencies across the lifecycle of NBS. Research suggests that knowledge gaps and skills shortage exist across many NBE market sectors relating to technology - from lack of online marketing and platform knowledge to advanced technology skill gaps in smart tech solutions for monitoring and evaluating NBS.

Conclusions

The 'Nature-based Economy' is an emerging perspective on the economic activities of consumption and production of goods and services with nature at their core. Robust feedback is needed from policy makers, practitioners and academics across economics, finance, public management and environmental science domains on the concepts contained in this paper and on the systemic transformation recommendations arising from this shift in how we understand and engage in economic activities.

In contrast, policies to stimulate demand and uptake of NBS are not new. International policy-makers in particular have been highly successful in embedding NBS into policies to address climate change and biodiversity loss and the EU has invested considerable resources in large-scale demonstration of NBS in cities across Europe. These demonstration projects have substantially increased awareness about NBS but have also revealed residual systemic problems hampering increased public sector and private sector investment in NBS at national and local government level. Substantive measures to instigate transformative change are needed to address many of these systemic challenges. In the interim the climate and biodiversity crisis won't wait. Therefore we advocate for sustained public sector investment in NBS in the short term, accompanied by longer term transformative change measures in systems and processes to instigate the necessary shift towards a Nature-based Economy. Investment in NBS should be accompanied by measures to ensure such investment leads to direct economic benefits in terms of increased innovation, enterprise and job creation in the private sector supplying NBS.

This paper also broaches the increasing challenges which are emerging in the supply of NBS. We propose a series of capacity building and support measures to stimulate the growth of skilled suppliers of NBS from the private sector in order to meet increased demand. The recommendations put forward for consultation in this draft White Paper aim to contribute significantly towards realising the aspirations of the European Green Deal and putting nature at the heart of an EU growth strategy which 'gives more back to the planet than it takes away'.

We invite you to contribute to the consultation process on this draft White Paper. Please visit us at networknature.eu/Nature-Based-Economy-White-Paper-Consultation to complete a short survey on priority recommendations or to submit a longer feedback as part of this consultation process.

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Horizon 2020 [Connecting Nature](#) is a consortium of 30 partners within 16 European countries, and hubs in Brazil, China, Korea & The Caucasus (Georgia and Armenia). We are co-working with local authorities, communities, industry partners, NGOs and academics who are investing in large scale implementation of nature-based projects in urban settings. Grant Agreement number: 730222.



Horizon 2020 [URBiNAT](#) focuses on the regeneration and integration of deprived social housing urban developments through an innovative and inclusive catalogue of Nature-Based Solutions (NBS), ensuring sustainability and mobilising driving forces for social cohesion. Grant Agreement number: 776783.



Horizon 2020 [UrbanGreenUp](#) aims at developing, applying and validating a methodology for Renaturing Urban Plans to mitigate the effects of climate change, improve air quality and water management and increase the sustainability of cities through innovative nature-based solutions. Grant Agreement number: 730426.



Horizon 2020 [REGREEN](#) promotes urban liveability, through fostering nature-based solutions in Europe and China using evidence-based tools and improved urban governance accelerating the transition towards equitable, green and healthy cities. Grant Agreement number: 821016.



Horizon 2020 [Clearing House](#) uses trees as a means to improve urban living in both Europe and China. Together with 10 cities and urban regions, the project partners will develop an online application, a global benchmark tool, and guidelines that can aid in the design, governance and management of urban forests. Grant Agreement number: 821242.



Horizon 2020 [Network Nature](#) is a resource for the nature-based solutions community, creating opportunities for local, regional and international cooperation to maximise the impact and spread of nature-based solutions. Grant Agreement number: 887396.



Horizon 2020 [Future Mares](#) examines the relations between climate change, marine biodiversity and ecosystem services. Our activities are designed around three Nature-based Solutions (NBS): Effective Restoration, Effective Conservation, and Sustainable Harvesting of Marine Resources. Grant Agreement number: 869300.



Horizon 2020 [MERCES](#) is focused on the restoration of different degraded marine habitats, with the aim of: 1) assessing the potential of different technologies and approaches; 2) quantifying the returns in terms of ecosystems services and their socio-economic impacts; 3) defining the legal-policy and governance frameworks needed to optimize the effectiveness of the different restoration approaches. Grant Agreement number: 689518.



Horizon 2020 [NAIAD](#) aims to operationalise the insurance value of ecosystems for water-related risk mitigation, by developing and testing concepts, tools and applications on 9 demo sites across Europe, under the common concept of Nature Based Solutions (NBS). Grant Agreement number: 730497.



Horizon 2020 [WeValueNature](#) is supporting businesses and the natural capital community to make valuing nature the new normal for businesses across Europe. Grant Agreement number: 821303.



Horizon 2020 [CleverCities](#) uses nature-based solutions to address urban challenges and promote social inclusion in cities across Europe, South America and China. Grant Agreement number: 776604.



Horizon 2020 [Naturvation](#) sought to develop our understanding of what nature-based solutions can achieve in cities, examine how innovation can be fostered in this domain, and contribute to realising the potential of nature-based solutions for responding to urban sustainability challenges by working with communities and stakeholders. Grant Agreement: 730243



LIFE [ARTISAN](#) is aiming to increase the resilience of France to climate change, by reinforcing the national adaptation to the impacts of climate change. The project will contribute to the achievement of objectives set in the second national climate adaptation plan and future plans.

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