

D3.8 White paper on how the private sector can be engaged in Research & Innovation programming and funding



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What is Biodiversa+

The European Biodiversity Partnership, Biodiversa+, supports excellent research on biodiversity with an impact for policy and society. Connecting science, policy and practice for transformative change, Biodiversa+ is part of the European Biodiversity Strategy for 2030 that aims to put Europe's biodiversity on a path to recovery by 2030. Co-funded by the European Commission, Biodiversa+ gathers partners from research funding, programming and environmental policy actors in European and associated countries to work on 5 main objectives:

1. Plan and support research and innovation on biodiversity through a shared strategy, annual joint calls for research projects and capacity building activities
2. Set up a network of harmonised schemes to improve monitoring of biodiversity and ecosystem services across Europe
3. Contribute to high-end knowledge for deploying Nature-based Solutions and valuation of biodiversity in the private sector
4. Ensure efficient science-based support for policy-making and implementation in Europe
5. Strengthen the relevance and impact of pan-European research on biodiversity in a global context.

More information at: <https://www.biodiversa.eu/>

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Executive summary

This White Paper explores how the private sector can be meaningfully involved in biodiversity research and innovation programming and funding. Its objectives are to map existing forms of engagement, identify barriers and success factors, analyse concrete collaboration models, and formulate recommendations to strengthen private sector participation. The analysis builds on existing Biodiversa+ outputs, European and global policy frameworks, and a qualitative research methodology based on semi-structured interviews with stakeholders involved in fourteen European initiatives.

The findings demonstrate that private sector engagement in biodiversity R&I brings significant added value. Businesses contribute operational knowledge, access to real-world testing environments, innovation capacity, and pathways to scale research results. Collaboration with companies accelerates the transition from fundamental research to applied solutions, enhances scientific relevance, and supports the uptake of biodiversity-friendly practices in sectors such as agriculture, infrastructure, and urban development. At the same time, collaboration with public research institutions ensures scientific rigour, credibility and long-term knowledge generation.

The White Paper proposes a typology of private sector engagement, combining levels of involvement (from information and consultation to full collaboration) with modes of engagement (direct funding, public-private partnerships, research governance, integration into business models, and multi-stakeholder networks). Analysis of the case studies shows a clear predominance of collaborative approaches, particularly through public-private partnerships and multi-stakeholder networks. These forms of engagement enable co-design of research, shared ownership of results, and effective scaling of solutions. Large companies often act as anchors for long-term programmes, while small and medium-sized enterprises play a crucial role as agile innovators, although they face structural barriers such as administrative burden and limited resources.

Despite these positive dynamics, several challenges persist. Misalignment between academic and business timelines, administrative complexity of European programmes, financial constraints, intellectual property concerns, and cultural differences between research and business communities can hinder collaboration. In particular, SMEs often struggle to fully engage in large-scale research consortia, and businesses frequently report difficulties in translating scientific outputs into operational value.

The White Paper identifies key success factors for effective engagement, including clear governance structures, mixed public-private funding schemes, co-construction of research agendas, alignment of biodiversity outcomes with economic incentives, and trust-building through networks and long-term relationships. It also highlights the growing importance of biodiversity data as shared infrastructure, stressing the need for interoperable, science-based and transparent data systems that enable both public and private actors to contribute to and benefit from biodiversity knowledge.

1. Introduction

1.1. Context & objectives

Biodiversity, encompassing genetic, species, and ecosystem diversity, is a shared natural heritage with profound importance for human livelihoods, food security, economy, health, and overall quality of life.

However, the alarming global trends reveal unprecedented decline in biodiversity, exacerbated by the intensifying human activities. These trends include severe alterations to terrestrial, freshwater and marine environments, accelerating species extinctions, and resulting in deterioration of the benefits provided by nature. These consequences include for example the potential loss of up to US\$577 billion in annual global crops due to pollinator decline (IPBES 2016) and the increased risk of floods and hurricanes affecting millions, extending to social equity, human well-being, and health (IPBES, 2019). Urgent transformative changes across economic, social, political, and technological sectors are required to achieve global conservation and sustainability goals by 2030, going beyond incremental changes and necessitating a shift in mindset (Hermoso et al., 2022a).

In the European context, despite extensive legal and policy frameworks aimed at conserving and sustainably managing natural habitats, species, and ecosystems, biodiversity continues to decline alarmingly (Hermoso et al., 2022b). This decline has significant economic costs, estimated at 3% of the EU's GDP per year, with insect pollinators playing a crucial role in agriculture (IPBES, 2018). Moreover, the degradation of ecosystems threatens the Natura 2000 network, valued at up to 300 billion € annually (European Commission. Directorate General for the Environment., 2013). The EU has adopted strategies like the EU Biodiversity Strategy to 2030, part of the European Green Deal, which holds the potential to bring about transformative changes through ambitious targets including for Protected Areas, nature restoration, organic farming, contributing to global action. In June 2022, the European Commission adopted the Nature Restoration Regulation which aims to restore various habitats and species to increase biodiversity, enhance ecosystem services, limit global warming, and improve resilience against natural disasters. It's a pivotal component of the EU Biodiversity Strategy, with a focus on revitalizing ecosystems to benefit both people and the environment. Additionally, in July 2025, the European Commission published the Nature Credit Roadmap, outlining its plan (2025-2027) to develop a common EU framework for nature credits. Its goal is to mobilize private finance to complement insufficient public funding and to reward land managers, farmers, foresters, conservation actors, and local communities for contributing to biodiversity recovery. Ultimately, it aims to create a transparent, science-based, and trustworthy system capable of scaling up investment in nature restoration across the EU.

Moreover, it is acknowledged that the EU's actions significantly affect biodiversity beyond its borders. Central and Western Europe and Central Asia depend on imports of food and animal feed, which were equivalent to the combined annual yields of 35 million hectares of agricultural land - about the size of Germany - in 2008 (IPBES, 2018). This emphasises the need for a holistic approach and recognises that consumer demand, export industries, and financial flows play a crucial role in driving resource use globally.

Indeed, the value of biodiversity remains underrated in economic decision-making. Investment decisions often overlook biodiversity's potential impacts and contributions to desired achievements. However, it is

increasingly clear that economic growth must transition into a sustainable green economy, with biodiversity playing a fundamental role. The green economy is recognised as a source of job growth (Newman et al., 2012), and the integration of natural capital into accounting and reporting systems seems essential.

Biodiversity is an asset in Nature-based Solutions, which offer cost-effective approaches to protect, conserve, restore, sustainably use and manage ecosystems (UNEA, 2022). Thus, adequate investment in Nature-based Solutions can contribute to biodiversity conservation and restoration while addressing societal challenges.

The European biodiversity Partnership, Biodiversa+, aims to support the contribution of Research & Innovation in the EU Biodiversity strategy to 2030: To enable transformative change while putting biodiversity on a path to recovery by 2030, for the benefit of climate and people. To do so Biodiversa+ focuses on 5 main objectives:

- Improved monitoring of biodiversity and ecosystem services across all land and sea habitats in Europe (status and trends);
- Actionable knowledge to tackle the drivers of biodiversity loss and ecosystem degradation;
- Evidence-based knowledge for the development and deployment of Nature-based Solutions to societal challenges in a sustainable and resilient way;
- Making the business case for biodiversity;
- Science-based support for EU policy-making.

Bringing together the private sector and innovation in research

In highlighting the significant impact of private sector activities on biodiversity, it becomes imperative to emphasise that resolving the crisis depends on their active participation. Moreover, their contribution to research and innovation (R&I) to find solutions is of importance. Indeed, the involvement of the private sector is essential to stimulate innovation and address the multifaceted global challenges. Given Biodiversa+'s commitment to advancing influential biodiversity research with policy and societal implications, the integration of the private sector into our research initiatives and funding processes is important.

1.2. Objectives: How can the private sector be involved in Research and Innovation?

- One of the primary goals of this white paper is to **provide an overview of the role that the private sector can play in R&I programming and funding**. It delves into the various ways in which businesses and private entities can contribute to R&I initiatives.
- The document seeks to **identify strategies and approaches for fostering greater engagement of the private sector in R&I programming and funding**. It explores ways to incentivise and encourage businesses to participate actively in these activities.

- It **analyses and presents various models of private sector participation in R&I efforts**. These models offer insights into how businesses can collaborate with the public sector, academia, and research institutions effectively.
- The document **discusses funding mechanisms and incentives** that can attract private sector involvement. This includes exploring financial tools, tax incentives, grants, and other means of facilitating private sector investment in R&I.
- Recognising that challenges often hinder private sector engagement, the white paper **addresses these obstacles and proposes solutions**. It examines issues such as risk assessment, and barriers to entry, offering practical recommendations for overcoming them.
- Finally, the White Paper **provides a set of recommendations**. These recommendations will offer actionable steps for businesses, research institutions, and policymakers to enhance private sector participation in R&I activities.

1.3. Methodology

This White paper builds on existing outputs produced by Biodiversa+ members and other relevant sources. As a complement, **a survey delves deeper into the reasons for private sector involvement in research and innovation (R&I) efforts**, to uncover both the potential benefits and the barriers inherent in such engagement. The survey focuses on the key players involved, highlighting the importance of stakeholder identification and representation across various industry sectors and countries. The methodology was centred on the conduction of semi-structured interviews and aimed at gathering information on fourteen initiatives, operational methods and the various perspectives of stakeholders concerning the funding and programming of R&I.

The interview process comprised three distinct phases. In the first phase, which focuses **on current activities**, key questions such as how ongoing engagement with the private sector can be achieved and when their involvement is most critical in R&I projects were explored. The second phase then sought to gather **views on the effectiveness and outcomes of these activities**, asking stakeholders about milestones, successes, failures and lessons learned. The third phase encouraged stakeholders to consider **ideal scenarios for private sector engagement**, eliciting views on collaboration with programming and funding bodies. The interviews were conducted between November 2023 and February 2024. The information processing plan focuses on transcription, organisation into themes and categories, qualitative analysis of trends and key points, and the use of quotes to illustrate findings, ensuring reliability and contextualisation within the study.

Transdisciplinary approach: structuring private sector engagement

The proposed methodology also builds on a combination of several approaches that have proven relevant when addressing the issue of engaging the private sector and businesses in biodiversity research programming and funding. One such approach is **transdisciplinarity**, which offers a valuable framework in this context as it helps us understand the importance of building connections between different worlds, notably public research and the business sector that unfortunately still lack meaningful dialogue.

Transdisciplinarity is generally defined by the inclusion of non-academic stakeholders in the knowledge-production process, going beyond disciplinary boundaries and standard interdisciplinary collaboration (Rigolot, 2020). It actively includes non-academic stakeholders, such as local communities, policymakers, business actors, NGOs, or citizens, in the co-production of knowledge. Transdisciplinarity recognises that scientific knowledge is just one form among many (e.g., local, indigenous, practical knowledge) and values them equally in the research process. This contrasts with both interdisciplinarity (collaboration between disciplines) and multidisciplinary (parallel work across disciplines without integration), as transdisciplinarity aims to dissolve the boundaries between science and society. It emerges in response to complex societal challenges (e.g., climate change, biodiversity loss, sustainability) that can't be solved by science alone (Suboticki, 2023). Stakeholders helped define research questions, choose methods, and interpret results. Instead of linear research steps, transdisciplinary work relies on mutual learning, continuous reflection, and adaptation between academics and stakeholders (Suboticki, 2023). However, according to insights from a presentation by Marc Deconchat, Director of the INRAE Biosefair Program, engaging stakeholders is often complex, as it raises issues related to roles, funding, expectations, and trust. The success of transdisciplinary efforts depends on mutual understanding, strong interpersonal relationships, and a moral contract grounded in honesty and reputation. Non-academic actors must be fully involved in the process, not just consulted occasionally. Additionally, making transdisciplinarity effective requires recognising differences, addressing asymmetries in knowledge and power. Only by acknowledging these limits can transdisciplinary efforts meaningfully engage with complex environmental problems and support more robust ways of understanding and responding to global change (Klenk & Meehan, 2015).

A second relevant approach: the Stakeholder Engagement Process (BiodivERsA)

The **BiodivERsA Stakeholder Engagement Handbook and its adaptation for Businesses** (soon available) provides a useful framework by defining different levels of engagement, from basic information-sharing to full collaboration. The most appropriate level of engagement for each business can be determined by considering the objectives of the engagement, the type of business, and the available resources.

- **Inform:** Providing businesses with balanced and objective information to enhance their understanding of the project and its potential relevance to their operations.
- **Consult:** Seeking feedback from businesses on aspects of the project design, methodologies, and potential outcomes, incorporating their insights to enhance relevance and practicality.
- **Involve:** Engaging businesses directly in the project lifecycle, ensuring their concerns and aspirations are considered and, where appropriate, integrated into decision-making.
- **Collaborate:** Working in partnership with businesses on key aspects of the project, enabling them to actively contribute to shaping its direction and outcomes.

In practice, many projects combine these different levels of engagement, adapting them to fit the specific context and the roles of the stakeholders involved. This tiered approach also offers a helpful lens through which to understand and assess how the private sector and businesses can engage in research and innovation (R&I) programming and funding.

Toward a typology of private sector engagement in biodiversity R&I programming and funding

We therefore proposed to categorise the fourteen examples gathered from interviews using a matrix that combined the different modes of engagement with the levels of involvement defined by BiodivERsA. The different modes of engagement included:

- Direct funding of research projects
- Public-private partnerships
- Participation in research governance
- Integration into business models
- Multi-stakeholder networks (Dinesen, 2025)

2. Private sector engagement in biodiversity R&I: insights, strategies, and collaborations

2.1. Insights from the Biodiversa+ workshop on Business and Biodiversity

Biodiversa+ hosted a workshop in June 2023 in Paris centred on enabling businesses to actively engage in European R&I endeavours, aimed at advancing the sustainable use and preservation of biodiversity (Danner 2023). The workshop had two primary objectives:

- Enhancing understanding and sharing experiences: It served as a platform to acquire and exchange insights pertaining to global and European biodiversity policies and frameworks.
- Identifying knowledge needs, challenges, and opportunities. This information was intended to guide R&I endeavours and contribute to the activities of the Biodiversa+.

The insights from the workshop can be broadly categorised into two areas (Danner, 2023):

Category 1: Raising capacity, awareness and education

- Develop tools and initiatives to enhance businesses' understanding of biodiversity and ecosystem functionality.
- Increase awareness regarding the Kunming-Montreal GBF and European biodiversity policies.
- Organise activities like workshops to simplify the communication of complex biodiversity issues to businesses.
- Standardise terminology and definitions while referencing the GBF.
- Communicate the necessity for transformative change, encompassing risk-taking and innovative approaches in research funding and governance, to businesses and financial institutions.
- Create platforms and opportunities for stakeholders to share knowledge and tools.

- Undertake research on society's reliance on biodiversity and changes in consumer behaviour, including the impact of certification and labelling on consumer choices and biodiversity.
- Enhance the communication of research project findings for practical use by businesses.
- Conduct research on ecological accounting.

Category 2: Developing enhanced tools

- Design tools to aid businesses in crafting clear roadmaps, determining resource needs, and identifying sources of support and expertise.
- Innovate new tools for calculating and communicating consumer impact more effectively.
- Standardise tools and metrics to ensure consistency and establish a baseline for evaluating biodiversity impacts, possibly by adopting a common metric like Mean Species Abundance (MSA).
- Create a monitoring system with meaningful indicators for businesses to track their impact in alignment with policy requirements and targets, including indicators related to the geographical location of business activities.
- Develop positive tools that highlight improvements, not just risks.

2.2. Insights from European strategies, Global initiatives, and Infrastructure integration

This White Paper builds on key outputs developed by Biodiversa+ and its partners, including the **Mapping of the Business and Biodiversity Landscape for European Research and Innovation** (Dinesen, 2025), **guidance on the use of public biodiversity data by the private sector** (Bakker & Teske, 2025), **best practices for sharing private-sector biodiversity data** (Ostermann et al., 2025), and insights from strategic dialogues on business and biodiversity. Together, these sources provide a coherent picture of how European and global frameworks, initiatives and infrastructures are shaping the integration of biodiversity into research, innovation and decision-making.

At EU level, business and biodiversity are addressed through a comprehensive policy mix combining sustainable finance, environmental objectives and corporate responsibility. Frameworks such as the European Green Deal, the EU Biodiversity Strategy for 2030, the EU Taxonomy, CSRD, SFDR and related initiatives increasingly position biodiversity as a material business issue and a condition for long-term economic resilience. These approaches are closely aligned with global agendas, including the UN 2030 Agenda, the Convention on Biological Diversity and the Kunming-Montreal Global Biodiversity Framework, all of which emphasise the critical role of the private sector in halting and reversing biodiversity loss.

Alongside policy developments, a growing ecosystem of initiatives, partnerships and tools has emerged to support implementation. As highlighted by Dinesen (2025), these initiatives span knowledge platforms, business-oriented coalitions and financial sector frameworks, and provide methodological support for measuring impacts and dependencies, natural capital accounting and action-oriented decision-making. Prominent examples include the EU Business & Biodiversity Platform,

Business for Nature, the Science Based Targets Network, the Finance for Biodiversity Pledge and the TNFD.

However, recent guidance underlines that the effectiveness of these tools and initiatives is strongly conditioned by access to robust, interoperable biodiversity data. While large volumes of public biodiversity data are available and companies generate substantial data through impact assessments, value-chain screening and restoration activities, uptake and data sharing remain limited. Treating biodiversity data as shared infrastructure, rather than as a by-product of reporting, is therefore increasingly recognised as a prerequisite for credible and scalable nature-positive strategies (Ostermann et al., 2025). Sustainable practices depend on a dual approach: pragmatic use of existing public data and systematic contribution of relevant private-sector data through common standards and platforms (Bakker & Teske, 2025; Ostermann et al., 2025).

2.3. The role of the private sector in Research and Innovation

This section presents **the benefits of involvement of the private sector in funding and programming research and innovation initiatives.** It highlights the growing importance of the private sector in promoting innovation and solving societal problems. It also examines the obstacles to be overcome to strengthen private sector participation in such initiatives. The information provided in this section comes mainly from interviews conducted as part of this study.

Private sector engagement in funding and programming research and innovation (R&I) on biodiversity offers benefits, including accelerating the transition from research to practical application, strengthening scientific rigour, enhancing knowledge generation, and supporting proactive solutions to address the biodiversity crisis across sectors such as agriculture, thereby fostering innovation, sustainability, and biodiversity conservation.

Here we present fourteen examples and projects from different countries in Europe based on our interviews (see the methodological section):

Enhancing collaboration for practical innovation

Effective collaboration between public research and the private sector is essential to move innovations from early research stages to practical, real-world applications. Drawing on experience at Agroamb (Spain), a small to medium-sized enterprise specialising in managing agricultural inputs such as fertilisers based on organic waste and forage, Alberto Amador highlights that while public research is critical for building foundational knowledge, close cooperation with businesses is needed to test solutions in real conditions and understand their impacts. Integrating the perspectives of citizens and stakeholders further enriches this process, supporting the development of robust, context-sensitive and scalable innovations.

Innovation is a result of a combination of genetic influences and environmental factors

Gian Luca Bagnara, project manager at Ca' Colonna, an Italian innovative small enterprise dedicated to integrated and sustainable agro-food chain, emphasises the possibility of providing collaborations for biodiversity research by offering their farm for on-the-ground experiments. This, according to him, is

essential for driving innovation. Indeed, for this enterprise the sustainability is the process of interaction between the natural territory and the socio-economic territory.

“One way to engage businesses in long-term biodiversity research is to conduct applied research in the field. The field provides the opportunity to focus on interactions between genetics and environmental factors. If these interactions are not taken into account, we won't have innovations. It is necessary to consider the environment and its uncertainties in research.” (Gian Luca Bagnara)

The role of the private sector in inspiring university innovation

For Claude Fromageot, the private sector, often seen as naïve in research, has a unique ability to ask unexpected questions that can act as catalysts for academic innovation. This naivety, far from being a limitation, becomes a driving force that stimulates new perspectives and challenges conventional thinking within the academic sphere.

Private companies, which are not subject to the traditional constraints of academia, have the potential to generate academic responses that chart alternative paths to success. Their unique questions and approaches not only contribute to the diversity of research but also stimulate academic creativity.

“In this dynamic interaction between the private sector and academia, unexpected questions posed by companies become essential drivers of innovation. By fostering a collaborative environment where naivety is accepted, academia can harness the potential of these external influences to propel research efforts into uncharted territory and ultimately enrich the academic landscape.” (Claude Fromageot)

Cultivating scientific rigor for sustainable innovation

In the realm of private sector innovation, university collaborations are vital for ensuring scientific rigor, as noted by Alberto Amador of Agroamb. Yannick Autret, from the French Ministry of Ecology, highlights initiatives like ITTECOP driving sustainability efforts and emphasises knowledge acquisition within the private sector. Pavel Dostal, representing GreenVille, stresses their commitment to innovation, particularly in green roof design. Dostal advocates for further research to deepen the understanding of green roofs' biodiversity contributions.

Ensure the scientific rigour of private 'sector endeavours

In the dynamic landscape of private sector efforts, cultivating scientific integrity through collaborations with universities is the cornerstone of success. Alberto Amador, representing Agroamb, emphasises the essential role played by universities in developing research methodologies that are both credible and solid. These alliances not only improve the reliability and validity of projects but also bridge the gap between theoretical knowledge and practical applications.

“Universities bring the expertise needed to design research in a credible and robust manner, enhancing the reliability and validity of our work. The collaborative efforts between private enterprises and academic institutions serve to bridge the gap between theoretical knowledge and real-world application.” (Alberto Amador, Agroamb)

ITTECOP: Driving methodological transformation for sustainable practices

Yannick Autret, from the French Ministry of Ecology and in charge of the ITTECOP programme, highlights the symbiotic nature of their actions, characterised by transparent methodologies and strong interpersonal relationships. Likewise, Jean-François Lesigne, former representative of the *Club des infrastructures linéaires pour la biodiversité*, stresses the urgent need for action, calling for a transformation of operational strategies to restore ecosystems. Based on scientific knowledge, this collaborative approach between research and industry prioritises informed decision-making, highlighting the essential role of knowledge acquisition within the private sector. The practical implementation of new solutions identified through research requires a reassessment of the traditional methodologies of the sector it represents. Initiatives such as ITTECOP facilitate closer collaboration between researchers and practitioners, encouraging private sector engineers to become actively involved in environmental and biodiversity issues. However, if project leaders and organisers are not convinced of the merits of change, progress is likely to stagnate.

GreenVille's pursuit of knowledge: Exploring biodiversity benefits in green roofs

Pavel Dostal represents GreenVille, a company headquartered in the Czech Republic. Specialising in the design, installation, and maintenance of green roofs, their expertise in this field spans 12 years. At GreenVille, they are dedicated to innovation and staying abreast of industry trends. Their commitment involves exploring nature-inspired solutions.

“We can hypothesise the outcomes based on results already observed in similar countries. Beyond our marketing objectives, we want to better understand which insect species are supporting by our roofs and determine what we should prioritise - weather specific plants, grasses, or particular combinations. We want to explore what happens when different types of plants are combined, how certain habitats are created, and what potential impact we can achieve. To make these claims, we need a more solid scientific foundation. We know that increasing biodiversity on green roofs benefits the environment, but we need to be more specific and precise on this topic.” (Pavel Dostal)

Private sector solutions for biodiversity conservation in agriculture

In the agricultural sector, Alberto Amador believes that the private sector has a role to play in resolving the biodiversity crisis.

“Finding better solutions for anticipating issues on farms, such as the application of fertilisers, is crucial. When it comes to biodegradable waste, as farmers and fertilising product producers, we have a role to play - we can influence the outcome, especially through lime treatment and composting plants. As such, it's essential to explore proactive approaches to deal with organic residues and contribute to addressing the biodiversity crisis.” (Alberto Amador)

Frederik is a consultant based in Denmark, employed by a consulting and research/innovation company with assignments for both private sector and public sector stakeholders, and with a primary focus on the farming industry. His work is specialised in the private sector and spans across individual farmers to large national and international companies in Denmark. The core objective of his consultancy is to bridge the gap between academic knowledge and practical application, particularly in the areas of biodiversity

conservation. The consultancy company specialises in all sectors related to farming and across various activities, such as research and development, digital solutions, events and education, testing, trials and experiments, data and analyses, a range of specialist services such as auditing, drafting and development plans.

From Frederik's perspective, private sector involvement is deemed crucial for addressing the biodiversity crisis, particularly in the context of agriculture and landownership. His education in spatial ecology and biodiversity conservation, includes studies in macroecology which has highlighted the significant impact of human activities, particularly in agriculture, on biodiversity. The ability to make small adjustments in the agricultural sector can have a substantial positive overall contribution.

Technological advancements have historically been instrumental in driving higher yields and reducing pressure on land use. Frederik emphasises that future advancements shape up to do the same and that it will be important to prepare for a future where more areas will be available for nature conservation, requiring the necessary knowledge and expertise. This is also partly due to constraints on what areas can be utilised for in the future. This trend is seen today with wetlands being rewetted to meet overall goals on climate and to avoid nutrient leakage.

In Denmark, climate change is identified as a key driver for change, leading to a decline in production in various sectors. Frederik utilises these changes as arguments within his work, emphasising the need for financial support through subsidies as a response to the expected decline in production.

2.4. Barriers and challenges

To meet the challenges of aligning the research needs of the private sector with those of academia, stakeholders in the field of biodiversity research and development have highlighted through the interviews conducted essential strategies of involving business from the project design stage, recognising real costs, managing value contrasts between the research and business paradigms and managing time constraints through self-funded initiatives.

Integrating biodiversity research into real-world applications for economic sustainability

In the field of biodiversity research, Gian Luca Bagnara, from Ca' Colonna, highlights the challenge of linking academic research with practical needs in the field, stressing the importance of integrating biodiversity into economic value chains to ensure sustainability. Edoardo Bagnara stresses the need for research to address real-world agricultural challenges, advocating collaborative solutions. As companies such as Ca' Colonna strive to achieve practical results, early involvement and field assessments emerge as crucial factors for successful collaborations.

One of the challenges identified by Gian Luca Bagnara, project manager at Ca' Colonna in Italy, is the difficulty in conveying their research needs related to biodiversity. Indeed, the company participates in numerous research initiatives by providing their farm for experiments, aiming to contribute to research projects designed by academics who are often disconnected from the reality of the field, their reality.

“Biodiversity research focuses on preserving it, restoring it, putting it under glass, as if it were a museum. We need to work with the idea of bringing biodiversity to the market, integrating it into the entire value chain. We need to add value to the market for our activity to be economically sustainable. What is crucial is to work on the value that can be generated from the protection of biodiversity. It is challenging to find collaborations in this direction, but we remain committed to participating in discussions to confront our culture with that of more academic researchers. Unfortunately, policies have not moved in this direction either, separating the economy and research on biodiversity protection, especially in the last 30 years. The final results of research are high-level publications, which is good, but we need to transfer knowledge in an operational way, otherwise our economic system cannot improve.”

“There is a lot of distance between the necessities of the farmers and those of the researchers. Researchers produce results that are not useful for farmers. Researchers should ask farmers what their problem is and then look for the solution. It's not about finding solutions without knowing the problem” (Edoardo Bagnara, Operating Manager). “Today, research is focused on producing more, but the problem is not that, it's about continuing to produce. Climate change, diseases affecting melon production. For example, we had 50% less melon production this year due to drought. We need to create resilience to climate change, and this is the first aspect to address.”

Gian Luca continues by stating that it is essential to involve businesses from the beginning of project conception. For example, the next project his company is collaborating on focuses on the varietal selection of vegetables and fruits to improve the production system and share the same framework of activities.

Also, in the end, it is important that the final evaluation takes place in the field, which is a constraint for academia, as stated by Gian Luca Ganara.

2.5. Business realities: financial constraints and misunderstandings with the public sector

Private companies engaged in biodiversity efforts encounter significant financial challenges and misunderstandings with the public sector, struggling to convey the true costs of their projects and facing pressure from consortium coordinators to reduce expenses, ultimately affecting their business sustainability. Andrea Barco from Biome-ID underscores the necessity for the public sector to grasp the economic realities of biodiversity work, emphasising the importance of fair cost allocations in consortium collaborations for sustainable partnerships.

“We experience challenges and frustrations, particularly on the financial side. We face a lack of understanding from the public sector regarding the true costs of our work. There is a struggle to make the public sector comprehend how much it really costs to work on biodiversity. As a private company, we need to earn money to sustain our employees. While biodiversity is our vocation, hard decisions must be made, and we cannot accept every project that comes our way from a consortium.”

“When we apply with a consortium, we present our costs, and the coordinator often asks us to cut down the private sector's costs since they have fewer restrictions than the public sector. This is not viable.” (Andrea Barco, Biome-ID)

Recognising the importance of private sector involvement in biodiversity work

Andrea Barco underscores the critical role of private sector engagement in biodiversity efforts, highlighting the shifting dynamics within scientific paradigms where fieldwork diminishes in significance, while the private sector's resources and expertise become increasingly vital. Barco emphasises the importance of recognising the pragmatic contributions of private entities, emphasising the need for adequate funding and budget comprehension to facilitate effective coordination between scientific and business realms.

Following Andrea Barco, *“The private sector involvement is important, and the real work needed should be acknowledged.”* The challenge lies in the traditional scientist's path: publish, apply, teach, find a position. Fieldwork is becoming less important, and the private sector, with facilities, laboratories, and knowledge, is well-positioned. Coordinating these elements would be ideal, but outsourcing requires sufficient funding and a better understanding of the budget.

Contrasting values: the different realms of research and business

Drawing from his extensive background in R&D and corporate social responsibility in the cosmetics industry, Claude Fromageot sheds light on the divergent values inherent in both the research and business realms. With a tenure of 15 years leading R&D in this sector, followed by another 15 years in Corporate Social Responsibility (RSE) at the same company, along with 5 years of experience as a management consultant, Fromageot brings a wealth of expertise to the table. Specialising in the cosmetics industry and affiliated with the MNHN, he underscores the distinct paradigms and value systems operating in these domains. While research champions humility, doubt, and intellectual inquiry, businesses prioritise rapid decision-making, often viewing doubt with suspicion.

Unlocking collaborative solutions: the ITTECOP programme's strategic vision for sustainable development in the field of infrastructure and biodiversity

Yannick Autret highlights the decreasing priority given to research in the infrastructure and biodiversity sectors, pointing out the compartmentalisation of policies governing infrastructure development and the lack of strategic vision, while emphasising the strategic ambition of the French ITTECOP programme as an opportunity to unite stakeholders, foster collaboration between sectors and improve collective efforts in favour of sustainable development.

“The role of research is much less of a priority for public and private players, particularly in the fields of infrastructure and biodiversity. Policies governing infrastructure development are often compartmentalised, reflecting the isolation of research and innovation, while the overall vision tends to be narrowly focused and lacks a strategic perspective.” (Yannick Autret, MTE)

The development of a strategic ambition by ITTECOP offers the opportunity to bring together key stakeholders. It is an opportunity to foster collaboration and synergy between key players from different

sectors. ITTECOP's strategic vision can act as a catalyst to bring together influential players, facilitating a coherent approach to tackling common challenges and capitalising on collective opportunities. Through this strategic ambition, ITTECOP can play a central role in creating a collaborative ecosystem that transcends traditional boundaries, encouraging effective partnerships and enhancing the impact of collective efforts for sustainable development and positive outcomes.

Managing time constraints and adopting self-funded initiatives

In the business world, speed of action is often paramount to achieving tangible results. However, the research process operates on a different timetable, involving numerous stages from obtaining funding to publishing results, leading to potential delays and administrative burdens. Pavel Dostal talks to us about his approach, which is to prioritise self-financing and help researchers bypass bureaucratic obstacles so that they can make effective progress with their scientific work.

“As a business, we prioritise action to achieve results promptly when we conceive an idea. However, the research process operates at a different pace. When a research idea is formulated, the initial step involves searching for grants, securing funding, conducting the research to gather data, and subsequently publishing the findings. This entire process is time-consuming, and the evaluation phase can be prolonged. Sometimes, inadequate support may lead to delays of months or even years, making it a challenging and lengthy endeavour. Faced with this reality, we opted to invest our own free time and resources. Researchers visited our rooftop, utilising their own means to map and collect insect species. This self-funded approach was crucial, enabling them to proceed with their research and publish findings without being hindered by potential delays associated with traditional grant-based funding.” (Pavel Dostal, GreenVille)

GreenVille does not rely on research funding, and the company prefers not to be closely tied to a consortium to obtain grants. This is primarily due to the extensive administrative burden and paperwork associated with such collaborations. Instead, their approach involves facilitating researchers in conducting their studies.

“We provide guidance, connect them with relevant individuals, and support them in obtaining the necessary data and know-how. This allows researchers to focus on their work efficiently while minimising the bureaucratic hurdles commonly associated with grant-dependent consortiums.”

3. Typology of private sector engagement

3.1. Framework for analysis: levels and modes of involvement

The **BiodivERsA Stakeholder Engagement Handbook** provides a useful framework by defining different levels of engagement, from basic information-sharing to full collaboration (see the methodological section).

We propose to categorise the fourteen examples gathered from interviews and our knowledge and experiences using a matrix that combines the different modes of engagement with the levels of involvement defined by BiodivERsA. The modes of engagement will include:

- **Direct funding of research projects:** companies provide financial support (often with public co-funding) to research activities, such as PhD research grants, research contracts, or specific studies. Their role is mainly to fund and benefit from results, without always co-directing the research.
- **Public-private partnerships:** formal collaborations between companies and public actors (universities, research organisations, public authorities), usually co-financed and co-managed. They involve joint project design, shared responsibilities, and common objectives.
- **Participation in research governance:** companies play an active role in defining research agendas, priorities, and strategies, by sitting on advisory boards, councils, or steering committees. Their influence goes beyond project participation to shaping the direction of research.
- **Integration into business models:** research outputs, methods, or standards are directly incorporated into a company's products, services, or operational practices. Biodiversity knowledge becomes part of the company's value chain.
- **Multi-stakeholder networks:** collaborations built on informal or formal networks that bring together diverse actors (businesses, researchers, NGOs, institutions, citizens). Engagement is based on dialogue, exchange of expertise, and collective problem-solving rather than bilateral contracts.

3.2. Categorisation of the fourteen examples collected

The following section categorises the fourteen examples collected according to both the **level of engagement** (from information-sharing to full collaboration) and the **mode of involvement** (funding, partnerships, governance, integration, or networks), see figure 1. This typology illustrates the diversity of business-research interactions, ranging from simple financial support or consultation to more strategic partnerships and co-construction of solutions. A summary overview of the examples is available in the annex.

Horizon Europe and Biodiversa+ differ from other examples discussed in this section in that they are fully dependent on European Commission funding. Private-sector engagement therefore does not take the form of direct financial co-investment in programme budgets, but rather participation through consortia, in-kind contributions, piloting, and application of research outputs. This funding structure shapes both the incentives and the constraints for business involvement.

Ca' Colonna's role in the European Commission's LIFE Carbon farming scheme

Ca' Colonna, based in Italia, is actively engaged as a partner in the European Commission LIFE Carbon Farming Scheme project spanning from 2021 to 2027. This initiative is centred on the ambitious goal of reducing the carbon footprint of mixed-farming-livestock farms by 15%. The project operates through a remuneration system that rewards farmers based on their achieved results in carbon reduction. By incentivising farmers to implement strategies aimed at diminishing their carbon footprint and enhancing carbon storage in both vegetation and soils, the project seeks to foster sustainable agricultural practices. Ca' Colonna's contributions to the project include gathering essential sustainability data to support ecological certification and facilitate the issuance of carbon credits. Notably, Ca' Colonna has made

significant strides in carbon sequestration efforts, with organic carbon levels in the soil rising from 1% in 2016 to an impressive 3.5% by 2020. For more information, visit the Life Carbon Farming website (life-carbon-farming.eu).

Analysis of the collaboration

- Level of engagement: Collaborate - Ca' Colonna is not simply consulted or informed, but acts as a true partner: collecting data, participating in monitoring and contributing to measurable results.
- Mode of engagement: Public-private partnership (PPP) - The company is involved in a European programme (LIFE), co-financed and co-managed by public and private actors.

The CIFRE thesis: Bringing together the academic and industrial sectors for a societal impact

In France, the CIFRE thesis program serves as a catalyst for collaboration between academia and industry, offering doctoral students the opportunity to conduct research in partnership with companies. H  l  ne Leriche, former Biodiversity-Economy Manager at the Or  e association, highlights the CIFRE program's significance in enabling companies to delve into peripheral and societal topics through research theses. Leriche facilitated a thesis focused on studying how actors in the Lyon-Saint-  tienne metropolitan area engage in transforming derelict spaces amidst global change (Sediri, 2022). The research explores whether such initiatives contribute to sustainable socio-economic and ecological development at the local level and delves into the methods employed by these actors. Notably, Leriche emphasises that while companies may shy away from addressing peripheral issues related to their core business, they readily invest in research that aligns with forward-looking and societal concerns. This approach allows companies to gain valuable insights and demonstrate their commitment to broader environmental and social themes.

“Companies can engage in research that may not necessarily relate to their core business but allows them to ask meaningful questions. The fate of wasteland sites, LIFTI as a land actor, and Suez on waste management were legitimate concerns to ponder, although not necessarily to champion directly; they supported them. It didn't cost them much and allowed them to have someone keeping an eye on the subject.”

“The key takeaway is that companies themselves address issues related to their core business, usually due to associated confidentiality. However, for more peripheral, forward-looking, and societal issues, they don't hesitate to invest, whether to obtain information or to demonstrate their involvement in these themes. When biodiversity research topics touch on the core business, companies generally avoid seeking public research due to issues related to property rights.”
(H  l  ne Leriche)

Analysis of the collaboration

- Level of engagement: Involve - Companies host the doctoral student, guide the subject, monitor progress and benefit from results, without fully co-directing the project.
- Mode of engagement: Direct funding of research projects - CIFRE relies on direct company funding (with public co-funding).

BIOME-ID Bozen

In 2023, Biome-ID seized the opportunity to contribute to an initiative by the University of Bozen in Italy, funded by Biodiversa+, focused on monitoring soil biodiversity. Using DNA-based analysis techniques, Biome-ID embarked on a collaborative project to assess the impact of different environmental conditions on the diversity of soil organisms. After presenting its methodology to the project leaders at a meeting in Bozen, Biome-ID received samples for DNA extraction and sequencing and then carried out bioinformatics analyses. This collaboration stems from Biome-ID's growing recognition within the DNA business network, initiated by the principal investigator's proactive efforts in seeking partnerships through informal channels. Drawing on their extensive scientific network cultivated during their previous roles as scientists and postdocs, Biome-ID has capitalised on established publications and chance encounters to establish fruitful collaborations.

Analysis of the collaboration

- Level of engagement: Collaborate - Biome-ID is not a service provider but a full scientific partner, contributing to results and co-construction.
- Mode of engagement: Multi-stakeholder networks - Involvement emerged from scientific networks and mutual recognition, rather than contracts or direct funding.

BIOME-ID AquaEcology

In the German urban environment, Biome-ID has established a collaboration with AquaEcology, a long-standing partner of the German Ministry of the Environment, specialising in aquatic and marine monitoring for two decades. AquaEcology's expertise lies in the systematic collection of samples, the identification of organisms, the calculation of parameters and the determination of biological status. Recognising the potential of DNA-based methodologies to improve the efficiency, accuracy and cost-effectiveness of monitoring, AquaEcology sought Biome-ID's expertise as a subcontractor to integrate these innovative techniques into its operations. This partnership has evolved from Biome-ID's proactive approach to engaging with businesses, involving persistent marketing efforts, email correspondence, phone calls and presentations of their monitoring solutions since 2016. Despite the initial scepticism encountered in the early stages, Biome-ID's perseverance has led to the establishment of a successful collaboration with AquaEcology, strengthening their diverse portfolio of customers and partners while paving the way for continued cooperation in the future.

Analysis of the collaboration

- Level of engagement: Involve - AquaEcology integrates Biome-ID as a technical partner to introduce a new methodology. Biome-ID does not define the entire project strategy, but contributes directly to improving practices. This goes beyond simple consultation (since their method is actually applied) but does not go as far as a full co-construction partnership (Collaborate).
- Mode of engagement: Integration into business models - AquaEcology has decided to integrate the DNA methods developed by Biome-ID into its ecological monitoring operations. This fits well with integration into the business model, as the innovation is incorporated into the value chain and the services offered.

SEGES Innovation

SEGES Innovation in Denmark, a company developing solutions for sustainable food production, has long-standing ties with universities, with many employees having academic backgrounds. One flagship project was initiated in collaboration with a local university focusing on biodiversity monitoring. The project assesses the effects of diversity actions at a landscape scale through a specialised tool, aiming to enhance biodiversity protection, restoration, and monitoring. A platform is being developed to allow farmers, public companies, and municipalities to input and manage biodiversity information. The collaboration also responds to the slow pace of policy development, seeking faster impact through applied partnerships. Looking forward, the company and university aim to internationalise their approach.

Analysis of the collaboration

- Level of engagement: Collaborate - the company is a co-initiator of the project with the university, contributes to the design of the platform and monitoring methods, and actively seeks funding with the university.
- Mode of engagement: Public-private partnerships (PPP) - The project is based on close collaboration between a university (public actor) and a private company, with joint development of tools and cross-financing.

GreenVille: promoting biodiversity on green roofs through university alliances

GreenVille, a Czech company, initiated discussions with academics to foster biodiversity research on green roofs. Two key collaborations have emerged:

(1) Entomological collaboration (Czech University of Life Sciences in Prague)

A research team specialised in insect biodiversity, supported by GreenVille, is assessing baseline biodiversity on green roofs. GreenVille facilitates access to literature and provides application fields, while researchers drive the scientific approach.

Analysis of the collaboration

- Level of engagement: Involve - GreenVille contributes and exchanges regularly but does not co-construct protocols.
- Mode of engagement: Multi-stakeholder networks - Collaboration relies on conferences, contacts, and informal exchanges.

(2) Botanical collaboration (South Bohemian University)

A team of botanists studies plant species fostering insect biodiversity. Here, GreenVille's practical experience with green roofs complements academic expertise to test strategies together.

Analysis of the collaboration

- Level of engagement: Collaborate - True co-construction of solutions combining practical and academic expertise.

- Mode of engagement: Public-private partnerships (PPP) - A clear partnership with joint development of applications.

Cemex - biodiversity integration and sectoral collaborations

Cemex, a leader in quarrying and concrete, has engaged in biodiversity initiatives since the 1990s. Partnerships with ECOCERT, the League for the Protection of Birds (LPO), unions, and researchers have enabled biodiversity monitoring in quarries and industrial operations. Cemex also co-develops monitoring protocols with academic researchers, integrating biodiversity into redevelopment and industrial practices.

Analysis of the collaboration

- Level of engagement: Collaborate - Cemex co-develops standards, integrates biodiversity into its model, and participates in multi-stakeholder networks.
- Mode of engagement: Integration into business models - Biodiversity is directly embedded in quarry operations and redevelopment strategies.

Roselière Program (association, partnerships, MNHN/University of Rennes thesis)

Launched in 2006 and taken over by the Roselière association in 2017, the program mobilises up to 19 quarries (including Cemex). It develops biodiversity indicators and hosts a thesis with MNHN and the University of Rennes, funded by OFB and unions. Cemex and other companies finance positions and provide access to data and sites.

Analysis of the collaboration

- Level of engagement: Involve to Collaborate - From financial support and site access to co-construction of indicators.
- Mode of engagement: Multi-stakeholder networks and Direct funding - Mix of company funding, memberships, and collaboration with researchers and institutions.

CILB & ITTECOP (linear infrastructure and biodiversity research)

The French CILB (created in 2008) brings together infrastructure companies (RTE, SNCF, etc.) under a structured charter, with priorities including biodiversity. To validate concepts like ecological corridors, the CILB partnered with ITTECOP, which provided a scientific committee and expertise. The collaboration relies on trust, iterative dialogue, and co-analysis with researchers.

Analysis of the collaboration

- Level of engagement: Collaborate - Companies help define research priorities, test concepts, provide field access, and engage in co-analysis with scientists.
- Mode of engagement: Multi-stakeholder networks + Participation in research governance - Structured charter, priorities, and involvement in FRB's governance.

PROCHES platform (Foundation for Biodiversity Research - FRB)

PROCHES (*Plateforme Proches*) addresses the lack of private sector funding for biodiversity research by creating a transparent platform where companies and researchers can connect. It encourages dialogue, justification of research relevance, and co-built projects with aligned interests. The platform also seeks to normalise private funding through collective and transparent processes.

Analysis of the collaboration

- Level of engagement: Consult to Involve - Dialogue and feedback (Consult), moving towards co-constructed projects with funding (Involve).
- Mode of engagement: Direct funding + Multi-stakeholder networks - Private funding is directed via a collective, transparent platform.

Agroamb (Spain, SME specialising in the management of agricultural inputs from organic waste and fodder)

Agroamb emphasises the need to collaborate with the public sector and universities to transform fundamental research into applied solutions. While public research plays a critical role in building foundational knowledge, practical implementation requires close synergy with private actors. Collaborations with universities bring scientific rigour and methodological credibility, reinforcing the reliability of projects. Agroamb participates in European consortia but highlights the difficulties of accessing leadership for small structures (size, administrative burden).

Analysis of the collaboration

- Level of engagement: Collaborate - Co-construction with universities and researchers, testing applied solutions with local actors.
- Mode of engagement: PPP + Multi-stakeholder networks - Co-financed European projects and active participation in consortia with multiple stakeholders.

Horizon Europe - private sector engagement in EU research programmes

Horizon Europe, the EU's key research and innovation programme (2021-2027), provides opportunities for private sector involvement in biodiversity-related projects. Companies participate in consortia alongside universities, research organisations, NGOs, and public authorities. Businesses contribute expertise, co-design methodologies, and test innovations in real-world contexts. While the programme's rules and administrative requirements can be demanding, it offers companies the possibility to engage in forward-looking research aligned with societal challenges such as biodiversity, climate change, and sustainable land use.

Analysis of the collaboration

- Level of engagement: Collaborate - Companies co-develop proposals, co-design methods, and test solutions in the field, in partnership with public and academic actors.
- Mode of engagement: Public-private partnerships (PPP) + Multi-stakeholder networks - Projects are built on consortia that pool funding and expertise from multiple sectors, including businesses.

Biodiversa+ - European co-funding mechanism for biodiversity research

Biodiversa+ is the European co-funded biodiversity partnership (2021-2027), gathering national research agencies, ministries, and other actors to fund transnational research. The programme explicitly encourages private sector engagement in research consortia and stakeholder advisory processes. Businesses can join projects as partners, providing case studies, applying research outputs, or integrating innovations into their business models. Biodiversa+ also supports stakeholder engagement platforms to facilitate dialogue between research and practice.

Analysis of the collaboration

- Level of engagement: Involve to Collaborate - Companies contribute data, test solutions, and participate in consortia. In some cases, they co-develop research questions and methodologies.
- Mode of engagement: Multi-stakeholder networks + Direct funding of research projects - Biodiversa+ creates international research networks and mobilises joint funding where private partners can play a role.

Overview

Table 1 combines levels of engagement (from Inform to Collaborate) with modes of involvement (funding, PPPs, governance, integration, networks). It shows how collaborations range from simple funding or consultation (e.g. CIFRE, PROCHES) to full co-construction (e.g. Horizon Europe, Biodiversa+, Cemex). Multi-stakeholder networks and PPPs emerge as the most frequent and mature forms, while some initiatives (e.g. PROCHES) are designed to evolve from consultation to deeper involvement.

Table 1 - Typology of private sector engagement in biodiversity research.

Categorisation of collaborations	Direct funding of research projects	Public-private partnerships	Participation in research governance	Integration into business models	Multi-stakeholder networks
Inform					
Consult	PROCHES (evolving)				
Involve	CIFRE thesis; Roselière or PROCHES also			Biome-ID (AquaEcology)	GreenVille-entomologie; Roselière ; PROCHES (evolving)
Collaborate		Ca' Colonna (LIFE); SEGES Innovation; GreenVille-botanique; Horizon Europe: Agroamb (Spain)	CILB & ITTECOP; Biodiversa+	Cemex	Biome-ID (Bozen); Horizon Europe; Biodiversa+; Agroamb (Spain)

'Evolving' = the collaboration starts at one level (Consult) but is designed to move up (Involve), depending on the maturity of the collaboration.

3.3. Emerging trends

On the basis of the proposed typology (levels of engagement × modes of involvement) and the set of case studies collected, several clear trends emerge regarding private sector participation in biodiversity-related research and innovation (R&I).

Predominance of Collaborative engagement

Most cases analysed (e.g. Ca' Colonna, SEGES Innovation, GreenVille-botany, Cemex, CILB & ITTECOP, Agroamb, Biodiversa+, Horizon Europe) fall into the “collaborate” category.

This demonstrates a strong tendency for private actors to go beyond simple funding or consultation, and to engage in strategic partnerships where they co-design projects, contribute expertise, and co-own results.

Ongoing Importance of the Involve level

A number of cases remain situated at the involve level (e.g. CIFRE theses, Biome-ID-AquaEcology, GreenVille-entomology, Roselière in its earlier phases).

These examples highlight the value of direct company participation (hosting doctoral students, applying methods, providing data), while also showing that many businesses stop short of full co-construction due to resource, governance, or intellectual property considerations.

Increasingly hybrid and evolving engagement

Engagement is rarely one-dimensional. Several cases combine different modes of involvement (e.g. Roselière: direct funding + multi-stakeholder network; PROCHEs: consultation evolving towards co-funding; Agroamb: PPPs combined with citizen-inclusive networks).

This underlines the dynamic and adaptive character of business-research collaborations, which often evolve from consultation and involvement towards more integrated forms of partnership.

Centrality of multi-stakeholder networks

Networks emerge as the most frequent and structuring mode of engagement (Biodiversa+, CILB & ITTECOP, GreenVille, PROCHEs).

They provide the trust-building infrastructure necessary for sustained collaboration, facilitate cross-sectoral knowledge exchange, and reduce barriers such as mutual mistrust between academia and industry.

The role of Public-Private Partnerships (PPPs) in scaling solutions

PPPs play a key role in bridging the gap between fundamental research and the applied needs of the private sector. They enable scientific knowledge to be tested, adapted and scaled in real-world contexts. Examples include Ca' Colonna's participation in the LIFE Carbon Farming project, SEGES Innovation's

biodiversity monitoring platform, and Agroamb's integration of circular economy approaches. These cases illustrate how PPPs can drive tangible impact while maintaining scientific credibility.

Large Companies as anchors vs. SMEs as innovators

Large corporations (e.g. Cemex, RTE/SNCF via CILB, Horizon Europe consortia) demonstrate the capacity to anchor long-term programmes, mobilise significant funding, and establish structured governance frameworks.

Conversely, SMEs (Biome-ID, Agroamb, GreenVille) play a crucial role as agile innovators, bringing methodological breakthroughs and niche expertise. However, they face structural barriers to leading large consortia, including administrative burdens and resource constraints.

Evidence of progressive trajectories

Several initiatives (e.g. Roselière, PROCHES) illustrate an evolutionary pathway of engagement: beginning with consultation, moving through involvement, and ultimately progressing towards collaborative partnership.

This reflects a gradual trust-building process and mutual learning curve, where both research institutions and businesses adapt their practices to reconcile differences in timing, funding, and expectations.

4. Success factors and challenges

The case studies collected illustrate both the **enabling conditions** that foster productive collaborations between businesses and the research community, and the **structural challenges** that often hinder the scaling or sustainability of these initiatives. Understanding these dynamics is crucial for designing future European policies and programmes that aim to mobilise the private sector for biodiversity research and innovation.

4.1. Success Factors

Multi-actor initiatives that establish **clear governance frameworks, defined responsibilities, and transparent processes** (e.g. CILB & ITTECOP, Biodiversa+) are more successful in building trust between partners. These mechanisms reduce the risk of power imbalances and allow both public and private actors to shape the research agenda in a balanced manner.

Mixed funding schemes that combine public and private resources (e.g. CIFRE theses, LIFE projects, Horizon Europe, Biodiversa+) provide stability and reduce the financial risk for companies. They also signal public recognition of biodiversity as a legitimate investment area, which further incentivises business participation.

Projects in which **companies and research organisations jointly design, implement, and evaluate solutions** (e.g. SEGES Innovation, Cemex, Agroamb) create stronger ownership, higher relevance, and

better uptake of results. **Co-construction** is particularly valuable when it integrates complementary expertise: scientific rigor on one side, operational know-how on the other.

Mechanisms that translate biodiversity action into direct benefits for businesses, such as financial remuneration (Ca' Colonna LIFE project), ecological certification, or carbon credits, make collaborations more attractive. Incentives not only compensate for short-term costs but also strengthen long-term engagement by aligning biodiversity with business interests.

Many collaborations arise from **personal connections, professional networks, or sectoral platforms** (e.g. Biome-ID collaborations, GreenVille's alliances). These informal channels facilitate trust-building, lower transaction costs, and open doors to new scientific or business opportunities. The ability to embed projects into existing communities of practice is a critical driver of success.

4.2. Key challenges

Businesses often prioritise rapid, applied, and market-relevant outcomes, whereas academic research tends to operate on longer timeframes with uncertain results. This **misalignment** can generate frustration or reduce the perceived value of collaboration (as seen in PROCHEs and ITTECOP discussions).

Participation in large European programmes such as Horizon Europe provides visibility and resources but poses significant barriers for SMEs. **Administrative complexity, reporting obligations, and the difficulty of acting as project coordinators** can discourage smaller players from active engagement.

Several initiatives (e.g. Roselière, PROCHEs) rely on project-based funding, annual memberships, or voluntary contributions. This creates **uncertainty for long-term planning** and threatens the continuity of programmes, making it difficult to maintain momentum and retain private sector interest.

When biodiversity research touches upon a company's core business (e.g. industrial processes, genetic resources, monitoring techniques), **issues of intellectual property and confidentiality** often arise. Companies may hesitate to collaborate openly with public researchers, fearing loss of competitive advantage or disclosure of sensitive data.

A recurrent challenge lies in the perception gap between academia and business. Research outputs are not always communicated in a way that highlights their practical or economic relevance, while companies may underestimate the value of scientific contributions. This **lack of mutual understanding** can limit uptake and reduce trust.

While large multinationals such as Cemex can dedicate resources to biodiversity research, SMEs often face **structural limitations** in terms of human and financial capacity. This creates an uneven playing field in which many smaller actors remain underrepresented in European research consortia, despite their potential role in local biodiversity solutions.

5. Conclusion

This White Paper clarifies how and why the private sector can play a decisive role in biodiversity research and innovation (R&I), not only as a user of knowledge but as a partner in shaping, testing, and scaling solutions. Through the analysis of fourteen case studies, it highlights the diversity of collaboration models and proposes a practical typology to position private sector engagement across different levels (from information to collaboration) and modes (funding, partnerships, governance, integration into business models, and multi-stakeholder networks).

Across the cases, a message emerges: the most effective collaborations are those built on trust, transparency, and co-construction. When businesses and research actors jointly define questions, align expectations, and recognise each other's constraints (timeframes, resources, confidentiality, and regulatory pressures) R&I becomes more actionable and more likely to translate into real-world change. Conversely, persistent barriers such as administrative burdens, misaligned incentives, limited SME capacity, and unresolved questions around costs, data, and intellectual property can undermine engagement and prevent promising initiatives from scaling.

In the context of accelerating biodiversity loss and the urgency of meeting 2030 goals, incremental steps are no longer sufficient. Strengthening private sector engagement in biodiversity R&I must be treated as a strategic priority, one that supports innovation, improves the uptake of scientific outputs, and mobilises broader resources for nature-positive transitions. Biodiversa+ is well positioned to contribute to this shift by fostering enabling conditions: clearer engagement pathways, fair recognition of private sector costs and contributions, stronger mechanisms for dialogue and governance, and improved data-sharing practices that enhance interoperability and credibility.

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