Deliverable 5.1

Ecological Restoration as a Business Model

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Summary

Ecological restoration (E.R) has increasingly become crucial to face environmental degradation[1], biodiversity loss and ecosystem decline. According to the European Environment Agency (EEA), biodiversity in Europe and in the rest of the world is under threat, with many species facing extinction. Over 80% of European habitats are in poor condition[2]. Factors such as agricultural intensification, land degradation, urban agglomeration, air and water pollution, and climate change contribute to this **biodiversity loss**.

International policies recognise the need to conserve and enhance the world's natural capital and ecosystem services. The United Nations (UN) declared 2021-2030 as the international decade of ecosystem restoration, and ambitious restoration targets have been included in the Kunming-Montréal Global Biodiversity Framework. Europe is obligated to protect and restore habitats and species under the European nature Directives, a challenge that may be enforced if the European Nature Restoration Law is passed.

Despite its contribution to nature projection and human wellbeing, ecological restoration faces several challenges that can hinder its inputs to a sustainable economic growth. These include the access to funding and resources, the policy frameworks, competing land-use interests, and community awareness[3]. Addressing these challenges requires, for stakeholders and future entrepreneurs, to understand the relevant *"ground rules"* of the market.

Here, we present a market analysis of ecological restoration with a focus on Europe. The Market Analysis report is structured in three sections: a broad and detailed analysis of ecological restoration as a business model, and a final section devoted to showcasing exemplary case studies. The first section aims to provide a comprehensive **broad analysis** of the fundamental context examining the political, economic, social, technological, environmental, and legal factors that shape the business activity. By digging into these factors, stakeholders and future entrepreneurs can gain valuable insights into opportunities, challenges, and emerging trends within this evolving market. This secondary research study provides a framework for insights and key components of the market dynamics, both at national and EU level. Then, this first framework approach is enriched with primary data, a **detailed questionnaire**[4] that facilitates understanding how the existing ecological

[1] Environmental degradation: the simplification or disruption of ecosystems caused by severe, unprecedented and/or prolonged anthropogenic disturbances (Bullock et al., 2011).

[2] https://www.europarl.europa.eu/news/en/press-room/20240223IPR18078/nature-restoration-parliament-adopts-law-to-restore-20-of-eu-s-land-and-sea

[3] Cortina-Segarra, J., et al. (2021). Barriers to ecological restoration in Europe: expert perspectives. *Restoration Ecology*, *29*(4), e13346.

[4] Questionnaire is available in Appendix 3

restoration companies have built up their **business model**, their perception of market trends and how they are dealing within the business framework.

Finally, in Appendix 1, national **business case studies** are presented to identify common strategies and business models drawing out their strengths and weaknesses, challenges and key success factors that may foster new ecological restoration business projects.

List of abbreviations

CSR	Corporate Social Responsibility
EU	European Union
EEA	European Environment Agency
ER	Ecological Restoration
GDP	Gross Domestic Product
GIS	Geographic Information System
IPBES	Intergovernmental Science-Police Platform on Biodiversity Ecosystem Services
IPCC	Intergovernmental Panel on Climate Change
NGO	Non-Governmental Organization
NCD	Natural Capital Declaration
SER	Society for Ecological Restoration
SDG	Sustainable Development Goals
UAV	Unmanned Aerial Vehicles
UN	United Nations

1. Broad Analysis of Ecological Restoration as a Business Model

The notion that there is a contradiction between protecting nature and the development of business has dominated Europe and most parts of the world for decades. However, there is now a growing awareness, and evidence that this approach is not valid. There is an urgent need to link land-degradation, restoration and economy in new ways and with new ambitions.

The Global Resources Outlook (IRP, 2019a) states that the Sustainable Development Goals (SDG) can only be achieved if resource use and environmental impacts can be decoupled from economic growth and human well-being. Further, it also claims that such decoupling is possible and can produce net positive gains for the environment, the society, and the economy (IRP, 2019b).

Recent studies and assessments have indicated that the output for economic activity and job creation potential of restoration is under-communicated, and that the restoration industry contributes to national economic growth and employment (Kelmenson et al., 2016). The "restoration economy" (BenDor et al., 2015) includes activities that directly and indirectly contribute to the implementation of restoration, as well as services, information, financing and governance support to perform restorative activities. Studies evaluating the direct economic benefit from restoration investment have shown large outcome, e.g. 1 USD input has been estimated to generate 7-30 USD in economic benefit (De Groot et al., 2013; Verdone & Seidl, 2017). The World Resources Institute designated ecosystem restoration as "one of the most overlooked opportunities for economic growth" (Ding et al., 2017).

1.1.- Political factors

As the pressure on nature is critical, and climate change mitigation is urgently needed, the global assessment reports from IPBES and IPCC especially point at ecosystem restoration as an inevitable tool to reverse global environmental degradation and protect biodiversity. Ecosystem restoration and the scientific field of restoration ecology has gradually shifted from a strong focus on ecology and the protection of biodiversity, towards a broader view of restoration to mitigate climate change, and support ecosystem services. From this, the link between ecosystem restoration and economic benefits and societal welfare has become increasingly obvious. Contributions from scientific disciplines other than ecology, such as social science, economy, law

and philosophy, has become increasingly demanded. Also, the interaction between different professional sectors including agronomy, forestry, civil engineering, and entrepreneurs, has received further attention, as the outcomes from large-scale restoration become evident (Hagen et al., 2022).

The need to restore degraded lands to meet the UN Sustainability Development Goals (SDG) has been clearly stated by IPBES and the IPCC. The co-benefits from land restoration and rehabilitation have been found for all the 17 SDGs (IRP, 2019b). In particular, the contribution from land restoration to achieve the SDGs is mentioned as a strategy for SDG 15 "Life on land" and SDG 13 "Climate action". However, the benefits, risks, trade-offs, and costs of restoration can be identified for each SDG. A business model for restoration should aim for a broad approach to the sustainable goals and could also be a tool to organize the business initiatives.

The UN member states have declared the Decade for Ecosystem Restoration (2021–2030)[5]. The Decade's vision is to expand ecological restoration through integration and upscaling. Restoration's economic, social and ecological outcome must be acknowledged and integrated in land-use planning and management. The Kunming-Montréal Global Biodiversity Framework (KM-GBF, COP15)[6] target #2 directly points at restoration[7] by ensuring that by 2030 at least 30% of degraded terrestrial ecosystems, inland waters, and marine and coastal ecosystems will be under effective restoration, in order to enhance biodiversity and ecosystem functions and services, ecological integrity, and habitat connectivity (Convention on Biological Diversity, 2024). Additionally, several of the other 22 targets indirectly depend on the upscaling and integration of ecological restoration.

In addition, the Paris Agreement recognizes restoration as an essential tool to mitigate climate change, and reports that halting biodiversity loss is one of top three opportunities for scaling up climate action, along with solar and wind power development (IPCC, 2022).

The UN Decade for ecosystem restoration (UNEP & F.A.O, 2020, 2023) has highlighted six barriers to the committed upscaling and integration of restoration; public awareness, political will, legislative and policy environment, implementation capacity, scientific research, and financing. These are broad barriers that must involve the total society and its professional and private actors. Many stakeholders must engage and become actively involved in

[5] https://www.decadeonrestoration.org/
[6] https://www.cbd.int/gbf
[7] https://www.cbd.int/gbf/targets/2

order to overcome several of these barriers, e.g. NGOs for the raise of public awareness, lobbying, and also rising the implementation capacity. These six barriers make a relevant and useful background for the formulation of business plans and to identify the potential for a "restoration economy". Future restoration businesses can be highly diverse and potentially be established in relation to overcoming most of these barriers. The link from the future businesses can be traced back to their contribution to upscaling, meaning increasing the size, scope, scale, and even the quality of restoration projects (Cliquet et al., 2022).

1.2.- Economic factors

The Society for Ecological Restoration[8] (SER, 2024) defines **ecological restoration** as the *process of assisting the recovery of an ecosystem that has been degraded, damaged or destroyed as a result of human activity (livestock, pollution, reduced water supply) or natural causes (landslides, wildfires, floods).*

Ecological restoration involves a diverse portfolio of activities that have to do with the intervention to restore[9]. This multifaceted approach is reflected in the **cross-cutting nature of different sectors** in which it is engaged and not only supports the conservation of biodiversity but also contributes to ecosystem resilience, climate change mitigation, and the provision of ecosystem services essential for human well-being.

Economically, more than half of the world's GDP (about 40 trillion euros) depends on nature and its services are exposed to natural losses (World Economic Forum, 2020). The three most nature-dependent sectors, such as construction, agriculture and food and beverages generate more than 7 billion euros of gross value added. Other industries, such as chemical production and materials, tourism, real estate, mining, transport and trade depend on nature for more than 50% of their gross value added through the supply chain.

According to the EU 2030 Biodiversity Strategy (European Commission, 2020a), biodiversity conservation brings direct economic benefits to many sectors of the economy. For example, conserving marine stocks can increase the annual profits of the seafood industry by more than 49 billion euros, while every euro invested in marine protected areas would generate a return of 319

[8] https://ser-rrc.org/what-is-ecological-restoration/

[9] Restoration: the process of assisting the recovery of an ecosystem that has been degraded, damaged or destroyed (Society for Ecological Restoration International Science and Policy Working Group (2004) SER International Primer on Ecological Restoration, Society for Ecological Restoration International)

euros. Additionally, nature protection through the Natura 2000 network generates benefits of between 200 and 300 billion euros per year.

A major challenge in analysing ecological restoration from the economic perspective is the lack of standardized data collection and industrial classification for this sector (Bullock et al., 2011). Public data sources typically do not capture detailed information on restoration-related work, making it difficult to apply traditional economic analysis methods to this field. Therefore, economic contribution of ecological restoration often remains underreported and poorly understood.

Ecological restoration involves a range of activities (Blessing & Barrientos, 2023) that intersect with both primary sectors, such as agriculture and livestock, secondary sectors like construction, industrial manufacturing and energy, and the tertiary sector, environmental consulting services, research, training and eco-tourism. **Primary sector** activities such as agriculture, forestry, fishing and hunting depend on a wide range of provisioning, regulating and supporting services that determine the sector's inputs, processes and outputs. Similarly, various **manufacturing** activities depend on ecosystem services for the supply of raw materials such as mining, energy supply, food and drink, textiles, wood and paper, while **service sectors** such as tourism, environmental education and creative industries depend on the cultural services provided by ecosystems (Nunes et al., 2011). This broad scope highlights the interconnectedness of restoration efforts with various aspects of the economy, emphasizing the need for a more integrated approach to understanding its economic impact.

Despite these challenges, the growing demand for ecological restoration activities and the regulatory obligations imposed by governments present significant opportunities for economic development and job creation. As societies increasingly recognize the importance of restoring degraded ecosystems, a burgeoning market for services and products related to ecological restoration is emerging. This market includes not only direct restoration activities but also supporting industries such as environmental consulting, specialized equipment manufacturing, and training programs.

In this sense, the study by BenDor et al. (2015) describes the **ecological restoration sector** in a broad sense according to the business function and highlights, among others, companies dedicated to planning, design and engineering, physical restoration (earth moving, planting, burning, etc.), monitoring, consulting, real estate (site acquisition), landscaping supplies, financing and legal services. On the other hand, the type of work that can be carried out by each of these companies also stands out within the restoration economy:

- Aquatic and riparian restoration and management.

- Wetland restoration and management.
- Clean ups and contamination management.
- Terrestrial habitat restoration and management.
- Mitigation Banking.
- Marine and estuarine restoration and management.
- Enhanced stewardship (timber, ranch, farm).
- Invasive species control and management.
- Species conservation and management.

More specifically, Moseley and Nielsen-Pincus (2009) describe the **activities and businesses** related to forest and watershed restoration and classify them as follows:

- Reforestation: Companies engaged in reforestation and forestry services, as well as other forest protection and timber production activities.
- Native plant restoration: Weed control, site preparation, transplanting and seeding services.
- Road decommissioning and mitigation: Companies engaged in the construction, rehabilitation and repair of roads and road-related structures.
- Aquatic habitat restoration: Water resource projects and open space improvements, as well as other heavy equipment and engineering project activities (not including road or structure construction).
- Stream habitat restoration: Companies engaged in excavation, grading, demolition and other heavy equipment operations.
- Fish ladder construction: Companies engaged in the pouring and finishing of structural concrete.
- Forest thinning and fuel reduction: Timber harvesting, timber cutting and hauling, and field chipping businesses.
- Irrigation efficiency: Operation and maintenance of water supply systems, including pumping stations, aqueducts and other systems for distribution, irrigation and other uses.

Therefore, the typology of the work and the projects carried out by the different companies is related to the ecosystem being restored. The European Commission (2022) establishes as restoration objectives: (1) Restoration of terrestrial, coastal and freshwater ecosystems, (2) Restoration of marine ecosystems, (3) Restoration of urban ecosystems, (4) Restoration of the natural connectivity of rivers and related floodplain natural functions, (5) Restoration of pollinator populations, (6) Restoration of agricultural ecosystems, (7) Restoration of forest ecosystems.

Considering the above and given the breadth of the ecological restoration sector, we can distinguish, as a **summary**, that companies involved in

ecological restoration provide a wide range of services. These include on-site restoration, monitoring, education and training, consultancy, planning and design, certification and restoration supplies. These businesses offer specific activities dedicated to biodiversity conservation, green building, renewable energy production, sustainable water management, infrastructure projects. They also address restoration within ecosystems such as mining sites, agro-ecosystems, peatlands, rivers, wetlands, woodlands and urban ecosystems. For a more comprehensive overview on ecological restoration activities and services, see Appendix 4.

Rewilding creates new opportunities for economic growth, generating new business opportunities and income and means **direct and indirect local jobs** that bring life back to local communities (*Rewilding Europe*, n.d.; ten Brink et al., 2017). With the annual investment of €6 billion in the Natura 2000 Network, it has supported a total of 104,000 direct jobs in protected area management and conservation activities and a further 70,000 in indirect and induced jobs. An estimated 1.3 million of the 9.6 million jobs in agriculture in the European Union are directly linked to the network, while it provides 73,000 jobs related to forestry. Finally, tourism employs more than 12 million people in Europe, of which 3.1 million are connected to protected areas such as Natura 2000. According to the EU biodiversity strategy for 2030 (European Commission, 2020a), it is estimated that this network will employ more than 500,000 people. By investing in ecological restoration, countries can stimulate job growth and reduce unemployment rates, while improving ecosystem resilience, leading to thriving local economies as well as providing a wide range of new perspectives, greater social coherence and a stronger sense of identity (*Rewilding Europe*, n.d.)

However, when trying to classify the ecological restoration sector within an economic activity, it is rather difficult to determine the employment generated in this sector by activity or occupation. The report *EU biodiversity objectives and the labour market* (Jurado et al., 2012), estimates the employment in biodiversity-related jobs in Europe which is summarised in the following table:

Table 1. Employment estimation in biodiversity-related jobs in Europe. Source: Jurado et al. (2012, p.32)

Country	Estimated number of jobs
EU15	• 125,000 jobs supporting nature protection-related activities
EU 27	• 14.9 million jobs (7% of the EU total) are in natural-resource based activities closely linked to biodiversity and highly dependent on the delivery of ecosystem services. • 180,000 - 207,000 jobs could be created by full implementation of Natura 2000 network.
Finland	• National Parks: total annual revenue from visitor spending amounts to €70.1 million + 893 local person-years employed. • Other important recreation areas: total annual revenue of visitor spending amounts to €16.9 million + 217 local person-years employed. • €1 public investment = €20 return.
France	• Nature, landscapes and biodiversity: 11,500 jobs (3% of environmental jobs). • Nature, landscapes and biodiversity incl. research or education jobs, and jobs that contribute to biodiversity conservation in sectors other than natural areas: 22,000 jobs. • Need 30,000 jobs by 2015 and 40,000 jobs by 2020 to implement the biodiversity target.
Germany	• 4 German national parks: €2.1 billion generated by visitors + 70,000 jobs. • Landscape conservation: 20,000 jobs. • Professional nature conservation: 12,000 • 97 nature reserves +14 national parks + 13 biosphere reserves: 290 million visitors a year. • Hobby fishing: 52,000 jobs directly or indirectly linked.
Spain	• 0.5 million green jobs: forest management (6.1%); organic agriculture and farming (9.4%); management of natural areas (2.1%). • 69,500 Spanish companies in the green economy employing over 410,000 people (2.2% of all Spanish employment). • 59,200 companies related to the provision of environmental goods and services, employing 320,000 people: 41.4% are companies in the agriculture and organic farming sector, employing 24,500 people (7.6% of the employment in this sector).

Financing is a major barrier for effective ecological restoration in Europe (Cortina-Segarra et al., 2021). Ensuring restoration is adequately resourced with funding and skills adequate to address socio-ecological complexity and to provide for ecosystem-oriented implementation, science-based knowledge, evaluation, monitoring, restoration techniques and technology should be a priority. This may be achieved by integrating ecological

restoration into major European Union funding programs (e.g. 2021–2027 Multiannual Financial Framework, CAP, Structural Funds), engaging major private stakeholders in sectors such as energy, food, and environment, implementing tax deductions and payment for ecosystem services, engaging developers to set aside funds for ecological restoration as a compensation for the use of land and resources, and promoting high-level public-private partnerships. An increased effort should be devoted to designing incentives that recognize the value of natural capital and the benefits of nature-based solutions.

The first Rio Earth Summit (United Nations, 1992) marked a pivotal moment in global environmental policy, setting the stage for groundbreaking international agreements aimed at addressing pressing environmental issues. During this summit, governments worldwide adopted conventions focused on biodiversity, climate change and desertification. These conventions laid the foundation for international cooperation and action to protect our planet's ecosystem and resources.

However, two decades later, at the Rio+20 Summit, it was the private sector that emerged as a key player in responding to environmental challenges. Business leaders, recognizing the profound material impacts of widespread ecosystem degradation on their operations and the broader economy, took centre stage. Among these leaders were an increasing number of financial institutions who acknowledge that the escalating pressures of population growth and climate change on our limited natural resources, coupled with rising commodity prices, needed a fundamentally new approach to business and finance.

In response to these challenges, the Natural Capital Declaration (Mulder et al., 2013; UNEP, 2012) was introduced. This Declaration represents a commitment from banks, investors and insurance companies to adapt their business models to better account for material significance of natural capital, culminating in the official launch of Declaration at the Rio+20 Summit.

This shift towards recognizing and incorporating natural capital into financial decision-making marked a significant evolution in how businesses approached sustainability. It underscores the growing understanding that the health and function of ecosystems is inextricably linked to economic stability and growth. As these financial institutions lead the way in integrating natural capital into their operations, they set a precedent for other sectors to follow, ultimately contributing to more sustainable and resilient economies worldwide.

The EU offers a range of financial instruments (Blessing & Barrientos, 2023) to support Nature Based Solutions and ecological restoration projects and initiatives. The following table provides a summary.

Table 2. Summary of funding options for ecological restoration projects and initiatives

Type of funding	Funding Options
Grant programs (2023)	✓Horizon Europe: Focuses on research and innovation with specific missions on climate change adaptation, water restoration and healthy soils. Offers grants for collaborative research projects. ✓LIFE programme: Dedicated to supporting the transition to a low-carbon and climate-resilient economy. Regularly releases calls for proposals. ✓COST Actions: Supports collaborative research networks for scientists and innovators. Funding covers networking activities but not the research itself. Ideal for exploring new ideas through collaboration.
Additional resources (2023)	✓National Contact Points: Provide guidance and information on applying for Horizon Europe and LIFE grants. ✓European Structural and Investment Funds: Managed by member states, one fund might offer financing for environmental research projects.
Loans and Guarantees (2023)	✓European Investment Bank: Provides loans for projects aligned with EU priorities, including biodiversity and Nature Based Solutions. Offers loans through intermediary financial institutions. ✓Green Checker Tool: Helps assess if a Nature Based Solution or Ecological Restoration project might be eligible for the European Investment Bank funding.
Crowdfunding[10]	✓Nature Solutions Platform: Launched by REGREEN project, it connects Nature Based Solution (E.R) projects with potential citizen investors through crowdfunding.
Sustainable Bonds[11] (2021)	✓Sustainable bonds: they finance projects that combine environmental and social factors. ✓Green bonds: they finance projects related to renewable energy, energy efficiency, biodiversity protection, circular economy, etc. ✓Social bonds: these are used to finance projects that help solve social problems, such as problems related to basic infrastructure, access to essential services, housing,

[10] Crowdfunding is a way of raising money to finance projects and businesses. It enables fundraisers to collect money from a large number of people via online platforms. file:///C:/Users/Usuario/Downloads/crowdfunding%20explained-ET0215043ENN.pdf (2015)

[11] Sustainable bonds are a type of debt issued by public or private institutions whose funds are used to finance sustainable projects, whether environmental, social or a mix of both.

	employment generation, food security, etc. Gender bonds that seek women's empowerment and equality are already a reality, with several of them issued around the world.

Source: Own elaboration based on Blessing & Barrientos (2023)

The concept of **Corporate Social Responsibility** (CSR) was first mentioned in 1953 by Howard R. Bowen in his work *Social Responsibilities of the Businessmen*, in which he appealed to the social responsibility of corporations to produce not only goods and services, but also to return to society part of what society had given them (Bowen, 2013). Generally, it refers to a firm's activities and status about its perceived societal or stakeholder obligations (Wood, 1991; Sen & Bhattacharya, 2001).

From the beginning, the academic focus was on satisfying the main market demand for profit, and investment in other social practices was linked to market performance (Uhlig et al., 2020), and narrowly limited to philanthropy and the contribution that a corporation could make to solving social problems (Ismail, 2009). However, sustainable business success and shareholder value cannot be achieved through short-term profit maximisation alone, but through market-oriented and, at the same time, responsible behaviour (European Commission, 2002).

Ultimately, the need to compete in new markets strategically to seek greater legitimacy, market visibility, and a good corporate image among competitors (Ailawadi et al., 2014) has maximised the concept of CSR. Businesses have now realised that they can contribute to sustainable development by managing their operations in a way that enhances economic growth and increases competitiveness, while ensuring environmental protection and promoting social responsibility, including the interests of consumers. Therefore, this current socio-economic vision embraces social welfare as an important issue for organisations that not only affects partners and shareholders but all stakeholders of the company (Abrantes Ferreira et al., 2010; Nave & Ferreira, 2019).

Given the above, Carroll (2009) defines CSR as *"the commitments of business companies to seek those strategies, to settle on those decisions, or to pursue those lines of activity that are according to societal values and expectations"*. In the same vein, Fontaine (2013) further defines it as the ongoing responsibility of companies to behave appropriately, fairly, and responsibly and to contribute to economic development by improving the lives of workers and their families, as well as the local community and society as a whole.

However, while there is no single, universal and accepted definition, the one offered offered by the World Business Council for Sustainable Development in 2000 incorporates many aspects of the essence of CSR:

> *Corporate social responsibility is the continuing commitment by businesses to behave ethically and contribute to economic development while improving the quality of life of the workforce and their families as well as of the local community and society at large* (Watts & Holme, 2000, p. 3).

Although these definitions are widely used within the CRS literature, in 2001, the European Commission, in its Green Paper, synthesised its definition as *"a concept whereby companies integrate social and environmental concerns in their business operations and their interactions with their stakeholders on a voluntary basis"* (p.6). In addition, it set out three main characteristics underlying this definition (European Commission, 2002):

- It is a behaviour by companies that goes beyond legal requirements and is voluntarily adopted because they consider it to be in their long-term interest.
- It is intrinsically linked to the concept of sustainable development in which companies must integrate economic, social, and environmental impacts into their operations.
- It is about the way companies are managed, not an optional "add-on" to core business activities.

The European Commission (2002) also recognised that Corporate Social Responsibility responded to the following fundamental changes in the business context of the 20th century:

- Globalisation has created new opportunities for companies, but it has also increased their organisational complexity leading to new responsibilities on a global scale, especially in developing countries.
- Image and reputation play an increasingly important role in the competitive environment of business, as consumers and NGOs need to be informed about the conditions under which products and services are produced and their impact on sustainability, rewarding socially and environmentally responsible companies through their behaviour.
- As knowledge and innovation become increasingly important for competitiveness, companies have a greater interest in retaining highly skilled and competent staff.

Taking these characteristics into account the company perceives added value in serving a broader set of social needs and expectations and receives net benefits derived from socially responsible action (Islam et al., 2021). Hence, the company is committed to enhancing the well-being of society through independent business practices and the use of company resources (Kotler & Lee, 2007), programmes in which companies not only seek to increase their profits but also contribute to the well-being of their shareholders (Hediger, 2010). Companies therefore actively participate in social initiatives, allocating business resources to respond, improve social welfare, and build better relationships with stakeholders (Barnett, 2007; Mahmud et al., 2021; McWilliams & Siegel, 2001).

Nevertheless, what do we mean by **stakeholders** when we talk about corporate social responsibility (CSR)? According to Freeman (1984, 2004), stakeholders are individuals or members of any group with the power of influence and who can affect or are affected by the activities of an organisation in achieving its mandatory organisational objectives and its voluntary social welfare motives. This includes those who can significantly influence how companies operate in society, such as shareholders, business partners, employees, suppliers, customers, local communities, non-governmental organisations (NGOs), government officials (GOs), and the environment (Cuesta-Valiño et al., 2019; Dmytriyev et al., 2021; Mahmud et al., 2021). It is therefore important that organisations consider the public interest and take responsibility for the impact of their activities on customers, suppliers, employees, shareholders, communities, and other stakeholders, as well as the environment (Ismail, 2009).

According to Nave and Ferreira (2019), CSR helps companies build their long-term reputation, which can help them attract better employees and increase investor's confidence. Ecological restoration is a long-term endeavour requiring sustained investment and commitment. Companies need to ensure their CSR initiatives and reflect a genuine commitment to environment stewardship. Chtourou and Triki (2017) also argue that in a crisis context, companies that implement CSR strategies perform better financially than those that maintain traditional management strategies. Finally, and not least, CSR programmes help to create competitive advantages. There are many other advantages for companies in implementing CSR policies or strategies, some of which are shown in the table below:

Table 3. Benefits of adopting CSR strategies in companies

Authors	Benefits
Kuo et al. (2012)	✓ Reducing costs by saving resources. ✓ Improving the image of companies in society. ✓ Allowing to develop new products. ✓ Facilitating the opening to new markets. ✓ Reducing legal risk and insurance costs. ✓ Ensuring a better quality of life.
Juscius (2007)	✓ Providing feedback between the company and the environment. ✓ Encouraging the search for ways to resolve problems by discussing objections with stakeholders. ✓ Increasing the opportunities of the firm for sustainable development.
Hejase et al. (2012)	✓ Better business risk management. ✓ Improving innovation, competitiveness and market position. ✓ Higher operational efficiency and cost savings. ✓ Creating a social capital in the community.
Dyck et al. (2015)	✓ Creating business-friendly long-term prospects. ✓ Changing societal needs and expectations. ✓ Allocating resources to solve social problems. ✓ Moral commitment to socially responsible activities. ✓ Strengthening human resources and intellectual capital. ✓ Ensuring reputation and security. ✓ Long-term sustainable growth and competitive advantage.

Source: Barauskaite & Streimikiene (2021)

By analysing its benefits, it becomes evident that CSR should not merely be considered a cost, an obstacle or a charity: CSR can be an opportunity, an innovation and a competitive excellence (Porter & Kramer, 2007), establishing it as the source of excellent social advancement in which companies' resources, professionals and knowledge are used for activities beneficial to the community. Therefore, companies should invest in CSR programmes and implement them accordingly (Lewis, 2003) to achieve greater excellence (Hidayati, 2011). Ecological restoration presents an opportunity for companies to mitigate environmental degradation and habitat destruction impacts and contribute to a healthier planet[12].

[12] https://www.restorationtrust.ie/home

Table 4. Benefits of CSR Strategies driven ecological restoration

Authors	Benefits
Etikan (2023)	✓Enhanced **Brand Image**: companies actively engaged in restoration projects can build a reputation for environmental stewardship, attracting environmentally conscious consumers and investors.
Bustamante et al. (2019)	✓**Risk mitigation**: ecological restoration can help mitigate risks associated with climate change, resource scarcity and environmental regulations.
Brancalion & Van Melis (2017)	✓**Increase Innovation**: the focus on restoration can foster innovation in areas like sustainable production processes and resource utilization, creating a competitive advantage.

1.3.- Social factors

Ecological restoration offers a great opportunity to improve the lives of current and future generations, while enhancing ecosystem health. Here, we examine the impact of ecological restoration on the well-being of society through a review of sustainable development goals related to the environment, which include safety from disasters, adequate livelihoods, employment, food, access to clean air and water, among others. The Sustainable Development Goals[13] adopted by the United Nations in 2015 provide a reference framework for promoting social, economic and environmental improvement. In this context, ecological restoration plays a fundamental role in addressing environmental challenges. In fact, it is featured in 10 of the 17 SDGs:

In addition, the final part of this section identifies groups of interest that may have an impact on these restoration initiatives, and suggests ways to engage them, as effective ecological restoration requires the participation of the community, and particularly of stakeholders affecting or being affected by restoration actions.

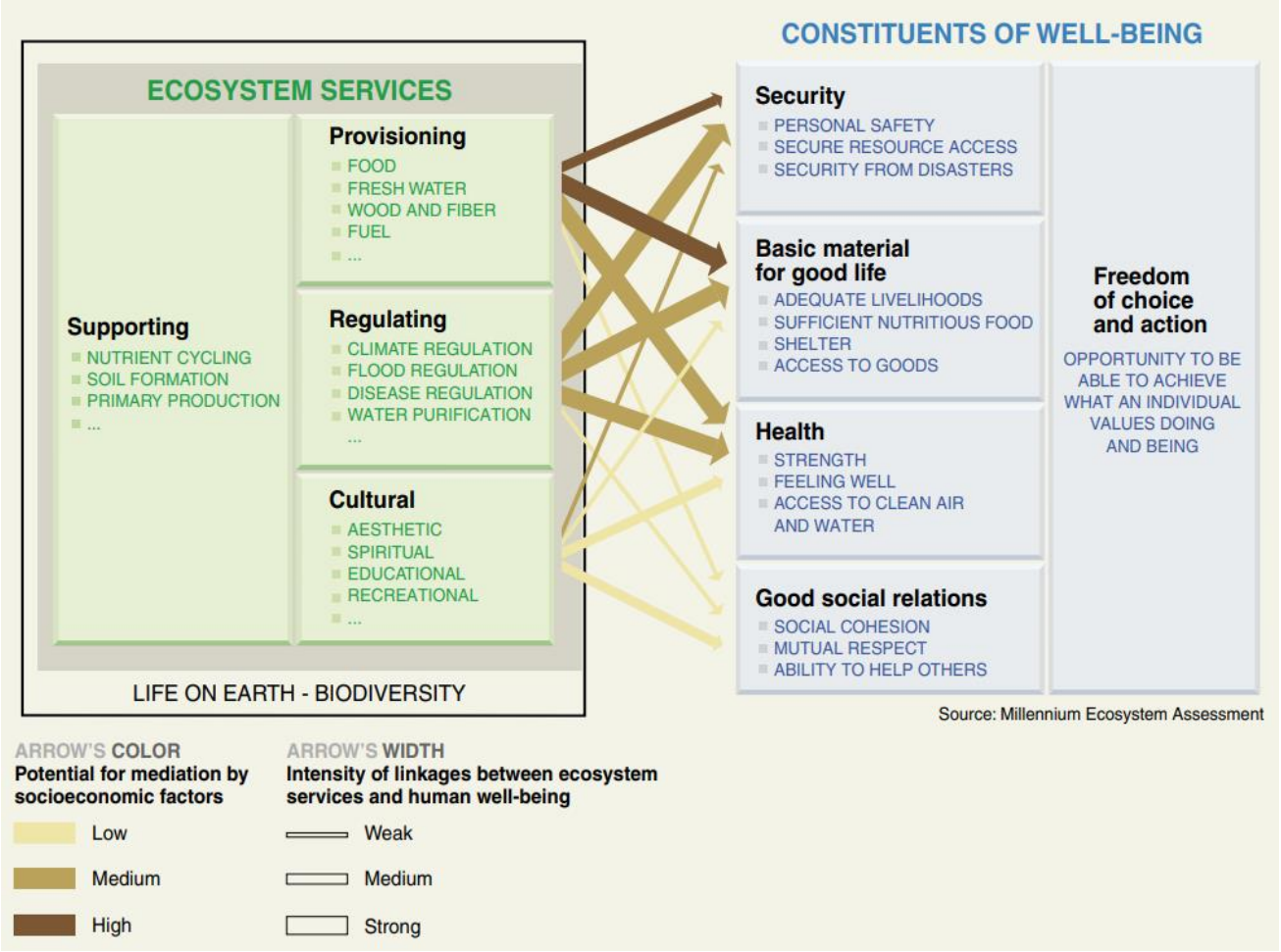
Reducing poverty (*SDG1-No Poverty*), putting an end to hunger (*SDG2-Zero Hunger*) and providing healthy life and well-being of people (*SDG3-Good Health and Well-Being*).

Natural capital refers, from an anthropocentric perspective to the *biophysical basis of ecosystems with the ecological capacity to generate services that satisfy human needs* (Oteros Rozas et al., 2023). Biodiverse ecosystems, such

[13] https://ods.mma.gob.cl/que-son-los-ods/

as wetlands, freshwaters, forests, as well as agricultural, sparsely vegetated, marine, coastal and urban ecosystems provide, if in good condition, a range of essential ecosystem services that contribute to a wide range of economic, social, cultural, regional and local benefits (European Commission, 2022). This concept emphasises the human-nature interrelationship that forms the framework for defining human well-being (Millennium Ecosystem Assessment, 2005): availability of essential resources for life, physical and mental health, good social relationships, security and freedom of decision and action (See Figure 1).

Figure 1. Linkages between Ecosystem Services and Human Well-Being



Source: Millennium Ecosystem Assessment, (2005, p. 50)

The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) developed the concept of nature's contributions to people (NCP) which is understood as those benefits (e.g. food supplies, water purification, pollination, ...) of the services nature provides freely to improve social wellbeing and individual quality of life (IPBES, 2019). Depending on their contribution to human well-being, three categories can be distinguished (Díaz et al., 2018). **Material contributions** refer to substances,

objects and material elements of nature that directly support people's physical existence and material goods (e.g. when organisms are transformed into food or energy), while **immaterial contributions** focus on subjective or psychological aspects that support people's quality of life individually or collectively (e.g. forests provide opportunities for recreation and social cohesion). In between these two positions, we find **regulatory contributions** that on the one hand regulate the generation of material and immaterial contributions and refer to functional and structural aspects of organisms and ecosystems that modify the environmental conditions that people experience, such as creation and maintenance of habitat, regulation of air and water quality, etc. These contributions of nature to well-being reflect elements of cultural identity, social cohesion, social responsibility and moral responsibility towards nature (Pascual et al., 2017).

Safeguarding the availability and sustainable management of water (*SDG6-Clean Water and Sanitation*).

As stated in the UN Environment's Freshwater Strategy 2017-2021 (UNEP, 2017), water and water-related ecosystems play a critical role in environmental health, providing services to people and communities, combating the impacts of climate change and all economic activities. Ecosystems such as wetlands, rivers, aquifers and lakes are indispensable for life on our planet and vital for directly securing a range of benefits and services such as drinking water, water for food and industry including energy, habitats for aquatic life and natural solutions for water purification and for buffering floods and overcoming periods of drought, among many others.

By 2030, the Freshwater Strategic Priorities (UNEP, 2022) set on their agenda to improve water quality by reducing pollution, eliminating discharges and minimising releases of chemicals and hazardous materials, halving the proportion of untreated wastewater and significantly increasing recycling and safe reuse worldwide. They also intend to apply integrated water resources management to all water resources and to protect and restore water-related ecosystems. This is where ecological restoration plays a key role, contributing to sustainable natural resource management by conserving and restoring habitats, protecting biodiversity and promoting sustainable water-use practices.

Promoting sustainable economic growth (*SDG8-Decent Work and Economic Growth*).

In this context, ecological restoration plays an important role by enhancing ecosystem services (Salles, 2011), creating employment opportunities, supporting natural resource management, and stimulating other sectors as tourism and leisure, energy, or sustainable construction. The links between

biodiversity, ecosystem services and employment are significant and closely interconnected as discussed in previous paragraphs. Jobs are linked to biodiversity directly through the management and conservation of protected areas, and from direct ecosystem services as well as indirectly through the provision of valuable ecosystem services such as nutrient cycling and water filtration or carbon storage (Nunes et al., 2011). Thus, according to Ruault et al. (2021), some works mitigate, avoid and compensate for biodiversity loss in a broad sense, such as ecological restoration. The number of jobs directly and indirectly generated by ecosystem services is significant. Seven percent of jobs in the European Union are related to biodiversity, which translates into 14.6 million jobs (Nunes et al., 2011).

Although it is not easy to determine which occupations are linked to biodiversity, a British study (Jurado et al., 2012) categorises these occupations into three categories:

1. Occupations focused on biodiversity conservation: This category includes surveillance, assessment, monitoring and advisory activities for habitat management and restoration, as well as training, research, communication and information management activities. Also, those related to implementation and policy development, and functions associated with the management of zoos, wildlife recovery centres, botanical gardens and green infrastructure. The projects related to ecological restoration require a diverse workforce with skills ranging from ecological science to community engagement, providing jobs for skilled and unskilled workers.

2. Jobs with a primary objective other than biodiversity conservation, but which have an impact on it are those that do not have biodiversity protection as their primary objective but have a strong impact on biodiversity conservation or the need to manage biological diversity, often because they depend on the use of natural resources. Examples include environmental management in the agriculture, forestry, mining and water sectors, the sourcing of materials and marketing of products by the manufacturing and retail sectors, as well as aspects of public administration that have a profound influence on biodiversity, such as land use planning, border control, public procurement and the management of infrastructure, premises, parks and green spaces. This category also includes jobs related to consultancy or financing of biodiversity projects, where biodiversity conservation is not the main purpose of the job.

3. Occupations that benefit from biodiversity and ecosystem services: involve activities that may have a limited direct influence on biodiversity but rely on biodiversity and ecosystem services for product

development (such as pharmaceuticals), benefit from visitors attracted to natural sites (such as tourism and recreation) or use biodiversity as a source of inspiration (such as the creative industries).

Integrating ecological restoration into development strategies and policies is essential for building a resilient and inclusive economy that benefits both people and the planet. Through collaborative action and innovative approaches, the potential of ecological restoration can be harnessed to drive sustainable economic growth and ensure a prosperous future for the new generations.

Creating more sustainable cities (***SDG11-Sustainable Cities and Communities***).

Sustainable cities (Yigitcanlar & Dizdaroglu, 2015) refer to an ideal urban structure formed by sustainable land use and urban design principles that allows for improved quality of life by providing social interactions and easier access to a wide range of services, minimising energy consumption through green building design, reducing greenhouse gas emissions and avoiding urban sprawl by restoring park and greenway systems. The protection of urban biodiversity is therefore conceived as an important component of sustainable cities (Brennan & O'Connor, 2008). In this sense, one of the principles of sustainable development is to protect and restore existing species, habitats and ecosystems in the city, and ecological restoration integrates nature-based solutions into urban planning and development strategies. Ecological restoration creates green infrastructure in urban areas (Kumar et al., 2024), including parks, green spaces, urban forest, wetlands and promotes wildlife-friendly urban design. Green infrastructures improve air quality, temperature regulation (by reducing the heat-island effect), flood mitigation, and biodiversity conservation, enhancing the liveability and resilience of cities. Urban restoration and rehabilitation projects increase ecosystem services and enhance the quality of life in cities (Klaus & Kiehl, 2021). These projects are cost-effective directly or indirectly when the restored green spaces increase the recreational value and attractiveness for tourism and citizen quality of life. These measures are economically necessary as they help to reduce the energy costs of cities and their inhabitants by, for example, planting trees to increase shade or greening roofs and facades to promote the thermoregulation of buildings. In addition, restoration also engages local communities in design, planning, execution and monitoring activities, fostering a sense of ownership, pride and belonging. Participatory approaches empower residents to contribute to the design, implementation and maintenance of green spaces, strengthening social cohesion and community resilience.

Ensuring sustainable consumption and production patterns (*SDG12-Responsible Consumption and Production*).

Although land degradation occurs mainly at local scales, its causes are often related to the economic production and unsustainable consumption of goods and services on a global scale (Fisher et al., 2019). In this case, ecological restoration initiatives promote waste reduction and recycling by restoring ecosystem functions and services while conserving and regenerating natural resources. Ecosystem restoration, therefore, requires not only resources and technology, but also behavioural changes, especially in the way land resources are managed, produced and consumed (Abhilash, 2021). Avoiding future landscape degradation and supporting regional restoration initiatives therefore requires behavioural change towards planet-friendly forms of industrial and agricultural production, green transport and consumption patterns based on the principles of the circular economy. By implementing circular economy principles, such as reuse, repair, reduce, refurbish and recycling, ER contributes to the efficient use of resources and the reduction of waste generation, leading to more sustainable consumption and production patterns.

The European Commission through *A new Circular Economy Action Plan for a cleaner and more competitive Europe* (European Commission, 2020b) aims to regulate the following aspects to accelerate the transition to a regenerative growth model that keeps resource consumption and production within the limits of the planet:

- Improving the durability, re-use, upgrade and repair of products by avoiding the presence of hazardous substances and increasing their energy efficiency.
- Increase the recycled content of products by ensuring their performance and safety.
- Facilitate remanufacturing and high-quality recycling.
- Reduce ecological and carbon footprint.
- Counteract premature obsolescence.
- Prohibiting the destruction of unsold durable goods.
- Incentivise models where producers retain ownership of the product and responsibility for its performance.
- Enhance digitisation of product information with solutions such as digital passports, labelling and watermarking.
- Reward products based on their sustainability performance.

One of the main initiatives of this plan is to identify the effects of the circular economy as a measure to mitigate and adapt to climate change, such as ecosystem restoration, reforestation, sustainable forest management, regenerative agriculture and carbon sequestration across habitat types.

Combating climate change (*SDG13-Climate Action*).

The existing context is characterised by a changing climate, with more increasingly extreme weather events. Intensive agriculture and livestock farming, deforestation processes or urban development remove protective soil cover and expose soil to wind and water erosion processes while biodiversity and habitats are rapidly declining. Consequently, ecosystems are changing rapidly (Malhi et al., 2020), not only in response to shifts in temperature, but also to associated variations in precipitation, atmospheric carbon dioxide concentration, water balance, ocean chemistry, and the frequency and magnitude of extreme events. In this context, ecological restoration activities help build resilience to climate change by increasing the tolerance level of organisms, removing invasive species and providing natural corridors for species mitigation (Lim et al., 2021). Ecological restoration initiatives in grasslands, forests and wetlands can act as carbon sinks capturing and storing atmospheric carbon thus helping to mitigate greenhouse gas emissions. Large-scale ecological restoration reduces the vulnerability of human communities to extreme weather events, drought and flooding. Biodiverse and complexly functioning ecosystems are more resilient to environmental challenges, reducing the risk of economic losses associated with ecosystem degradation. However, it should be noted that the design and implementation of ecological restoration must be adapted to climate change (Simonson et al., 2021). For example, the species targeted for a restoration site should reflect suitable climatic conditions both now and in the near future, as promoting landscape heterogeneity and biodiversity safeguards the evolutionary potential of species and their ability to adapt to a changing environment.

Preserving underwater life (*SDG14-Life below Water*) and halting biodiversity loss (*SDG15-Life on Land*).

In 2010, the ocean contributed 2.5% of global Gross Domestic Product (GDP) and its industry provided employment for 31 million people (Global Environment Facility, 2018; OECD, 2016). Coastal wetlands, such as seagrass meadows, mangroves, salt marshes, macroalgal and algal beds, shell reefs, intertidal freshwater wetlands and coral reefs, provide vital services such as coastal protection from sea level rise and storms, fisheries production, blue carbon sequestration, and pollutant removal and detoxification (Nagelkerken et al., 2015). However, the ability of the oceans to sustain human well-being as a source of food, water, clean energy and as a means to mitigate climate change faces a major challenge (Duarte et al., 2020). These systems are subject to and threatened by increasing industrialisation and urbanisation, loss of biological and physical resources (fish, water, energy and space) and are less resilient to the consequences of global warming and sea level rise (Elliott et

al., 2016). In this sense, the restoration of coastal ecosystems is categorically necessary, especially since nearly 40% of the global human population lives near a coast(UNEP, n.d.; Waltham et al., 2020) as it recognises the need for sustainable use of seas and oceans, improving livelihoods and employment while preserving these ecosystems. Likewise, the restoration of degraded habitats, such as forests, wetlands, and grasslands, enhances the conservation of endangered species, promote the genetic diversity, and restore ecological functions critical for the preservation of the biodiversity.

So far, we have seen how ecological restoration contributes to the well-being of society through reducing poverty, providing healthy living, sustainably managing water and agricultural resources, providing jobs, creating sustainable cities to live in, improving consumption and production patterns, combating climate change and preserving biodiversity. Ecological restoration is therefore conceived as a social system that must involve all stakeholders and communities in its initiatives. Involving stakeholders in ecological restoration projects helps them connect with the area to be restored and acquire knowledge and skills, empowering them to provide local knowledge to similar processes in other locations. They can also help evaluate ecosystem services and prioritise the distribution of restoration actions across the landscape, set project objectives (including the desired level of recovery), provide knowledge about ecological conditions and successional patterns, and provide political and financial support for the long-term sustainability of the project, as well as moderating conflicts or disagreements that may arise (Gann et al., 2019; Silva et al. 2023).

Ecological restoration projects, to be successful, must include as many stakeholders as possible (Sterling et al., 2017). The first of the 8 principles underpinning ecological restoration supports stakeholder involvement given that people and local rural or urban communities benefit when restoration reinforces nature-based cultures, practices and livelihoods (Gann et al 2019). These projects represent an indefinite and long-term commitment to local natural resources and often require intentional abandonment of the activities that caused the initial degradation. It therefore benefits from collective decisions that are likely to be more respected, implemented and sustained over the long term than unilateral decisions (Keenleyside et al., 2012). Building on local ecological knowledge and priorities and ensuring that stakeholder livelihoods are a consideration and a direct outcome of restoration, will increase the probability that restoration projects will result not only in improved ecosystem functioning and services but also in strengthened human and community relationships that sustain local economies and cultural practices (Gornish et al., 2021).

In identifying stakeholders, the social and ecological boundaries of a restoration project must be defined (Metzger et al., 2017). Consideration must therefore be given to those individuals and groups who benefit from or suffer the effects of degradation at the restoration site and those who could be affected by degradation efforts. These include local communities, government agencies, universities, researchers, landowners, private companies, conservation groups and NGOs, tourism agencies, local experts, visitors and the general public. It should not be forgotten that community groups are also composed of volunteers who are involved in ecological restoration projects for social reasons, such as contribution to the community, social interaction, environmental care or a sense of attachment to a particular place (Hagger et al., 2017).

Ultimately, as Elias et al. (2022) specify in their *Ten people-centred rules for socially sustainable ecosystem restoration*, in essence, restoration initiatives must focus on communities as agents of change and their values, priorities, aspirations and capacities, and therefore recognise and understand the diversity of stakeholders and their interrelationships:

- To facilitate key functions, initiatives should strengthen the resources available in communities and build on existing community capacities.
- To facilitate stakeholder participation and avoid triggering tensions with natural resources, ecological restoration projects need to consider the socio-historical contexts of the area.
- The tenure rights of different stakeholders should be identified, and opportunities sought to strengthen the resource rights of marginalised groups, recognising and addressing equity issues in their multiple dimensions and temporal and spatial scales.
- Restoration projects need to promote a range of benefits that are equitably distributed among stakeholders over time and ensure that the risks are mitigated while costs are equitably shared.

It should also be noted that ecological restoration activities can also create learning and experiential opportunities for visitors to connect more deeply with restored areas, either through direct participation in the restoration process or the opportunity to understand more about a restored ecosystem (Keenleyside et al., 2012). Furthermore, carrying out ecological restoration projects provides short- and long-term employment opportunities for these stakeholders, thereby creating ecologically and economically positive feedback loops (Gann et al., 2019).

1.4.- Technological factors

Recent technological advances have had a major impact on the way we design and implement ecological restoration and assess its outcomes. The following sections summarize some of the most outstanding technological innovations in ecological restoration and discuss their relationship with the theme of this report.

Remote Sensing and GIS Technology.

Remote sensing and Geographic Information System (GIS) technologies have become indispensable tools for ecological restoration and natural risk management, transforming our approach to environmental conservation and mitigation strategies.

Until a few years ago, free satellite imagery was predominantly sourced from NASA/USGS Landsat Program[14]. However, since 2015, the Copernicus program[15] by the European Space Agency (ESA) and the European Commission, represents a groundbreaking effort in Earth observation. Copernicus offers a comprehensive suite of satellite missions, including Sentinel-1 and Sentinel-2, which provide high-resolution, multispectral, and radar imagery, facilitating a wide range of applications in environmental monitoring, disaster management, climate change analysis, and more. By providing free and open access to its data, Copernicus has democratized Earth observation, empowering researchers, policymakers, and the public to better understand and address global challenges.

Additionally, advancements in Very High Resolution (VHR) satellite technology, exemplified by the WorldView[16] series from DigitalGlobe, offer imagery with unparalleled clarity and detail, enabling precise mapping and monitoring of ecological parameters at the local scale. These VHR satellites, with resolutions down to the sub-meter level, are particularly valuable for monitoring small-scale disturbances and biodiversity hotspots

Recently, NASA, in collaboration with the Jet Propulsion Laboratory (JPL) and the Canadian Space Agency (CSA), has installed a laser sensor known as GEDI[17] on the International Space Station (ISS). The goal of GEDI is to map and study the three-dimensional (3D) structure of forests and other terrestrial ecosystems from space. Using high-resolution laser technology, it provides

[14] https://landsat.gsfc.nasa.gov/
[15] https://www.copernicus.eu/en
[16] https://worldview.earthdata.nasa.gov/
[17] https://gedi.umd.edu/

accurate measurements of the 3D structure of the ecosystem, which is, among others, a valuable information on the state of structural restoration of forests. By integrating GEDI with data from other sensors, such as Sentinel, it is possible to assess forest health, identify degraded or deforested areas (Potapov et al., 2021) that require priority attention, and monitor the progress of restoration efforts over time (Holcomb et al., 2023).

Similarly, airborne Light Detection and Ranging (LiDAR) data from national or regional campaigns has further enhanced our capabilities, enabling detailed three-dimensional analysis of terrain and vegetation structures. This technology has proven valuable for characterizing landscapes and identifying crucial elements for ecological restoration and risk assessment (Almeida et al., 2019).

Geographic information systems (GIS) such as QGIS play a key role in spatial analysis and visualization. QGIS, an open-source software, offers a wide range of tools for processing and interpreting geospatial data, facilitating informed decision making in ecological restoration and disaster management initiatives (Kurwakumire et al., 2019; Martin, 2009). In this way, the integration of remote sensing and GIS data is a powerful tool in ecological restoration, allowing, among others, habitat mapping, invasive species detection and monitoring of restoration progress. Similarly, in natural hazard management, these technologies help identify areas vulnerable to floods, wildfires or erosion, allowing proactive measures to be taken to mitigate potential impacts and improve ecosystem resilience (Giardino et al., 2012).

Drones and Aerial Surveys.

Drones, or unmanned aerial vehicles (UAVs), have become essential tools for ecological restoration, enabling enhanced project planning, monitoring, and implementation (Robinson et al., 2022). In the field of environmental monitoring, drones have been used for a variety of applications, including assessment of vegetation dynamics, wildlife research, and habitat mapping (Ventura et al., 2017). Furthermore, lightweight drones have been tested as a tool for long-term forest monitoring, providing low-cost, high-resolution data that can contribute to advancements in theoretical and applied ecology (Zhang et al., 2016).

There are different types of UAVs, each adapted to specific applications. Fixed-wing drones are well-suited for large-scale mapping missions due to their efficient coverage and long flight range, while rotary-wing drones, such as quadcopters, offer greater manoeuvrability and program flexibility, making

them suitable for detailed inspections and short-range surveys in difficult terrain (Hsia et al., 2012). Vertical take-off and landing (VTOL) UAVs, which combine the advantages of both fixed-wing and rotary-wing drones, are particularly useful in areas with limited manoeuvrability (Kumar et al., 2021).

One of the main strengths of UAVs is their ability to capture high-resolution images or data and quickly and accurately assess large and inaccessible areas, yielding useful insights into ecosystem dynamics and terrain characteristics (Rango et al., 2009; Hackney & Clayton, 2015).

Equipped with state-of-the-art sensors, such as multispectral cameras or LiDAR (Light Detection and Ranging), UAVs enable accurate mapping of vegetation structure (Puliti et al., 2015), species distribution and habitat connectivity (Aristizábal-Botero et al., 2021), or generating baseline assessments, identifying degraded areas (Gao et al., 2020), and selecting optimal sites for restoration interventions. However, UAV have inherent limitations, such as flight duration and payload capacity, which may restrict their suitability for long-term monitoring projects or large-scale assessments (Villa et al., 2016). Despite this, the ability to access remote or difficult terrain ensures an in-depth knowledge of the landscape, allowing informed decision making (Jones et al., 2006).

The combination of increased computing power and the use of UAVs has significantly advanced digital photogrammetry, making it a powerful tool in various applications (Bösemann, 2005). Thus, thanks to the development of techniques such as Structure from Motion (SfM), it is possible to accurately reconstruct terrain and three-dimensional objects from images captured by UAVs (Clapuyt et al., 2016; Goodbody et al., 2017), which has democratized access to high-resolution geospatial data. Replacing in many applications more expensive sensors and allowing effective work in tasks such as the study of habitat structure, topographic features and landscape dynamics.

Aerial drone surveys can play a key role in monitoring restoration progress by providing a cost-effective, real-time monitoring solution for collecting baseline data and assessing ecosystem recovery (Gómez-Sapiens et al., 2021). By capturing repeated images over time, UAVs facilitate the assessment of changes in land cover (Morgan et al., 2021), vegetation health and density (de Castro et al., 2021) or soil erosion rates (D'Oleire-Oltmanns et al., 2012), allowing practitioners to evaluate restoration interventions and adjust management strategies accordingly.

The use of UAVs in aerial surveys improves the efficiency of field surveys and data collection. Rather than relying solely on ground-based methods, which can be time- and resource-intensive, UAVs provide a bird's-eye view that helps analyse ecological indicators, habitat boundaries or key species distributions. This comprehensive spatial data, when integrated with the Geographic Information System (GIS) technology mentioned in the previous section, further supports detailed analysis and planning of restoration activities.

Data analysis and modelling.

Data analysis and modelling are essential tools in ecological restoration, providing a framework for understanding ecosystems and guiding restoration efforts (Fischenich, 2008). These tools are particularly important in identifying patterns, assessing impacts, and predicting future outcomes (Jørgensen & Fath, 2011). However, their application in ecological restoration requires adherence to good modelling practice, which is often overlooked (Schmolke et al., 2010). Despite this, the use of ecological history as a tool in restoration efforts can help in identifying appropriate targets and preparing for future changes (Jackson & Hobbs, 2009).

Data analysis is a crucial component of ecological restoration, enabling the assessment of restoration effectiveness and the identification of trends and relationships between biotic and abiotic variables. This is particularly important in large-scale restoration programs, where a composite index can be used to assess restoration effectiveness and its relationship to socio-economic factors (Li et al., 2017). Monitoring restoration progress is also essential, with a focus on assessing the effectiveness of activities and measuring ecological advancement toward recovery goals (Hooper et al., 2016), helping to determine if implemented strategies are achieving desired objectives. Lastly, compositional data analysis can be used to understand and improve the ecological location of a study area (Ichinose & Katoh, 1998).

Modelling in ecological restoration goes beyond descriptive data analysis. These models can simulate different scenarios and predict future outcomes, aiding in the assessment of restoration strategies and their potential impact. The iterative and dynamic nature of quantitative modelling can help anticipate how ecosystems will respond to environmental and human-induced changes, which is crucial for planning effective long-term restoration interventions (Swannack et al., 2012). Furthermore, modelling allows for the assessment of the impact of different restoration actions before implementation, aiding in prioritizing and optimizing available resources.

The field of ecological restoration has evolved significantly in its data analysis and modelling techniques. Initially, classical statistical methods like linear

regression and analysis of variance were used (Michener, 1997). However, the increasing availability of software and computational power has led to the emergence of more sophisticated approaches. These include a diverse range of analytical tools for modelling species distributions, such as logistic regression and other techniques from different scientific disciplines (Hegel et al., 2010). Overall, these advancements have allowed for more accurate and complex modelling of ecological systems, contributing to the field's progress.

Bayesian models, for example, allow for the incorporation of uncertainty and prior knowledge into modelling, which is essential in ecology due to the complex and dynamic nature of ecosystems (Wintle et al., 2003). They allow for the combination of observed data with expert knowledge, which is particularly useful when data are limited (Choy et al., 2009). Additionally, machine learning and deep learning have significantly advanced ecological data analysis, particularly in species classification, biodiversity assessment, and land use change detection from remote sensing data (Borowiec et al., 2022; Christin et al., 2019). These methods have been successfully applied to identify species, classify animal behaviour, estimate biodiversity, and model ecological time-series data (Christin et al., 2019; Recknagel, 2001).

A range of models are used in ecological restoration, each tailored to different aspects of ecology and ecosystem management. Species distribution models (SDMs), for example, are valuable tools for conservation planning, providing critical information on species' geographic extent and habitat requirements (Lawler et al., 2011), and contribute to many aspects of restoration planning. Population dynamics models simulate changes in populations over time, helping to assess the long-term success of restoration interventions and the conservation of threatened species (Zipkin & Saunders, 2018). Food web models explore the interactions between species and how these interactions affect the structure and function of ecosystems, which is critical to understanding and conserving biodiversity (Thompson et al., 2012).

Data analysis and modelling provide a solid basis for understanding ecosystem complexity and developing effective strategies for their restoration. However, to fully exploit its potential, progress is still needed on some challenges, such as the integration of data from multiple sources (Isaac et al., 2020), the assessment of uncertainty in models (Geary et al., 2020), and the effective communication of results to decision-makers (Parker et al., 2002). With advancing technology and collaboration among scientists, managers, and local communities, data analysis and modelling can remain powerful tools in the conservation and restoration of the world's ecosystems.

Innovative Planting and Seeding Technologies.

Hydroseeding with drones has emerged as an innovative and promising technology for ecological restoration projects, allowing for the efficient dispersal of seeds and materials in restoration applications without disturbing habitats (Ridge & Johnston, 2020). Drones equipped with hydroseeding equipment may in some cases offer a number of advantages over traditional seeding methods. The most important and obvious is that drones provide remote access to challenging terrains such as rugged landscapes, steep slopes, wetlands, and dense forests, which are often difficult for ground-based equipment or personnel to reach. This capability allows for the efficient coverage of large areas in a short time frame, making it particularly beneficial for time-sensitive restoration projects or large-scale reclamation efforts. This can significantly improve the efficiency and speed of certain seeding or overseeding activities during ecological restoration.

Precision application is another key aspect where innovative technologies excel. Techniques like CS higher-order granulation technology and TBS galvanized wire complex grass-shrub planting method offer precise and targeted approaches to planting, ensuring optimal growth conditions for restored vegetation (Yang et al., 2019). This precision application contributes to the success of restoration projects by enhancing plant survival rates and ecosystem recovery.

Remote sensing and data collection tools allows for monitoring and assessing restoration progress rapidly and accurately (Malmstrom et al., 2009). Remote sensing technologies provide valuable data for assessing restoration progress, ecosystem recovery, and the impact of restoration activities on biodiversity (Pettorelli et al., 2014). This real-time monitoring capability allows for prompt adjustments and interventions, leading to more efficient restoration outcomes. Thus, restoration practitioners can make informed decisions and track the long-term effectiveness of restoration efforts.

Compared to ground-based equipment, drones have a lower environmental impact, as they minimize soil compaction and disturbance to sensitive ecosystems. This helps to minimize disturbances to the environment during the restoration process (Wen et al., 2020). By utilizing data-driven approaches, restoration projects can be planned and executed with minimal ecological footprint, ensuring sustainable restoration practices. Additionally, the precise application of seed mixtures helps minimize the spread of invasive species and can reduce the use of herbicides.

Using drones for hydroseeding can improve job safety, especially in remote areas that are difficult to access, as it reduces the need for manual intervention in challenging or hazardous restoration sites (McKenna et al., 2023). Additionally, precise application techniques minimize risks associated with incorrect planting or seeding practices, further promoting safety in restoration activities.

Cost-effectiveness is a key factor in the sustainability of ecological restoration projects. Technologies like remote sensing and precision application methods help optimize resource allocation and minimize costs associated with manual labour and material wastage (Cheng, 2021). By streamlining processes and maximizing efficiency, innovative planting and seeding technologies contribute to the overall cost-effectiveness of restoration initiatives.

Overall, hydroseeding with drones offers a promising approach to ecological restoration, providing efficient, precise, and environmentally friendly solutions for reclaiming degraded landscapes and promoting biodiversity conservation. As technology continues to advance, the use of drones in restoration efforts is likely to become more widespread and impactful.

Blockchain and Traceability.

Blockchain technologies have the potential to enhance ecological restoration efforts through various applications, particularly in monitoring and tracking restoration projects. By utilizing blockchain, stakeholders can securely record and verify data related to habitat restoration, species reintroduction, and ecosystem recovery, thereby improving transparency, effectiveness, and traceability in restoration activities (Wang & Li, 2022). The immutable and transparent nature of blockchain technology can enhance accountability and trust in restoration initiatives, addressing the increasing societal demand for ecosystem restoration due to environmental degradation and anticipated future environmental changes (Suding, 2011)

The potential of blockchain in ecological restoration aligns with its broader applications in supply chain management, where it has been recognized for promoting data sharing, optimizing business processes, reducing operational costs, improving collaborative efficiency, and establishing credible systems (Y. Li & Chen, 2023). Furthermore, blockchain's role in ensuring agricultural sustainability has been explored, highlighting its ability to support traceability, decentralization, security, transparency unforgeability, smart contracts, and verifiability (Chen et al., 2021; Singh, 2022). These features are crucial for

maintaining the integrity of ecological restoration data and fostering trust among stakeholders involved in such projects.

Additionally, blockchain technology facilitates the creation of innovative financing mechanisms for ecological restoration projects. By leveraging blockchain technology, smart contracts can establish transparent and automated funding mechanisms (Nazmus Saadat et al., 2019). These smart contracts, which are immutable and self-executing, can ensure that financial resources are allocated efficiently to support restoration efforts (Nikolić et al., 2018). This can include crowdfunding platforms specifically designed for ecological restoration, where individuals and organizations can contribute directly to restoration projects and monitor the progress in real-time (Joshi et al., 2023). Crowdfunding has emerged as a popular mechanism for funding innovative ventures, allowing projects to secure financial support from a diverse pool of backers (Babayoff & Shehory, 2022). Successful crowdfunding campaigns often involve engaging backers in the project design and development process, fostering a sense of connection and ownership among funders (Kang et al., 2016).

Another important application of blockchain in ecological restoration is in the management of biodiversity offsets and conservation credits. Blockchain can provide a transparent and immutable ledger for recording biodiversity offsets generated through restoration activities, as well as the trading of conservation credits among stakeholders. This approach not only ensures accountability in transactions but also incentivizes private investment in ecological restoration initiatives, creating new funding opportunities through the sale of conservation credits (Mao et al., 2018).

Blockchain technology has the potential to enhance ecological monitoring systems by enabling decentralized data collection, storage, and sharing among stakeholders. This approach can improve the resilience and adaptability of restoration projects through real-time data-driven decision-making and enhanced collaboration (Trollman et al., 2022). The decentralized nature of blockchain ensures data security and integrity, making it a valuable tool for creating secure databases (Lahkani et al., 2020). Additionally, blockchain technology provides transparency, data immutability, privacy, and security, which are crucial for applications like ecological monitoring (Fernández-Caramés & Fraga-Lamas, 2019).

By integrating blockchain technology into ecological restoration efforts, stakeholders can enhance the traceability of restoration activities, ensuring that projects are implemented according to best practices and standards. This

enhanced traceability can help build confidence among stakeholders, including investors, regulators, and local communities, and ensure the long-term success and sustainability of restoration initiatives.

Digital Platforms for Collaboration and Knowledge Sharing.

Digital platforms play a crucial role in fostering collaboration and knowledge sharing in the field of ecological restoration. These platforms enable innovation processes by facilitating collaboration among collectives through knowledge sharing and work execution platforms, crowdsourcing, crowdfunding, virtual worlds, digital makerspaces, and social media (Nambisan et al., 2017). The effectiveness of ecosystem restoration is emphasized when approached from a social-ecological perspective, highlighting the importance of integrating social and ecological dimensions (Fischer et al., 2021). Social media platforms have emerged as vital tools for sharing knowledge related to peatland and ecosystem restoration, underlining their significance in disseminating information (Winarno et al., 2022).

Studies have shown that knowledge exchange enhances engagement in ecological restoration initiatives by offering opportunities to improve collaboration and knowledge sharing among organizations and workers involved in restoration activities (Favretto et al., 2022). Knowledge and data sharing are crucial for informing robust ecological restoration science, emphasizing the critical role of sharing, compiling, and synthesizing information (Ladouceur et al., 2022). Furthermore, knowledge management practices are essential for the ecological restoration of various ecosystems, such as the tropical dry forest in Colombia, showcasing the importance of managing knowledge for successful restoration efforts (Torres-Romero & Acosta-Prado, 2022).

Collaboration among stakeholders with diverse social and ecological motivations is essential for achieving landscape restoration goals, highlighting the need for recognizing and integrating various motivations to realize multiple benefits (Jellinek et al., 2019). Scientific collaboration has become increasingly important in ecological restoration research, emphasizing the significance of working together across disciplines and countries to advance restoration efforts (Guan et al., 2019). Integrated large-scale science that transcends biome boundaries is essential for ecological restoration to contribute effectively to international policy goals (Temperton et al., 2019).

Platforms like SpeciesLink connect restoration practitioners with essential resources such as project information, seed suppliers, and relevant scientific publications. Another invaluable tool is iNaturalist, a citizen science app that enables both ecologists and the public to document species observations. This collective effort contributes valuable data to restoration projects including citizen scientists who play a crucial role in monitoring and documenting ecosystem changes. Additionally, the Restoration Registry, developed by the Society for Ecological Restoration, facilitates communication and collaboration among restoration professionals worldwide.

The benefits of using these digital platforms for ecological restoration are manifold. Centralized platforms like these accumulate and share best practices, project data, and restoration techniques, accelerating learning and innovation across the field. They enable practitioners to connect with colleagues working on similar projects, fostering knowledge exchange and problem-solving across geographical boundaries. Furthermore, shared protocols and data collection methods provided by these platforms improve project consistency and comparability, leading to better outcomes.

As the field of ecological restoration continues to grow, these platforms will play a crucial role in connecting people, sharing knowledge, and amplifying efforts to restore degraded ecosystems worldwide.

1.5.- Environmental factors

The dramatic pressure and degradation of land and its social consequences have been well documented globally (IPBES, 2018). The cost of land degradation, in terms of loss of biodiversity, damage to human health and wellbeing, reduction of nature's ability to deliver ecosystem services, and reduction of resilience to climate change, is a global issue. Today, 75% of the global land surface has been severely altered by humans and 85% of all wetland areas are lost. Even in presumptive pristine regions, such as Norway, more that 20% of evaluated species are on the red-list, 2/3 of all major river systems are strongly modified, mainly from hydropower development, and more that 1/3 of peatlands are degraded.

The World economic forum has calculated that 50% of the global economy is under threat from biodiversity loss (World Economic Forum, 2023). Nature's benefit to people is under pressure and have estimated an annual 10% reduction of GNP if degradation of land continues at present rate. Ecosystem

restoration is an essential tool to reverse landscape degradation and halt the loss in ecosystem services, and consequently, damages to the global economy.

The UN Restoration Decade call upon a large range of actions to contribute to the recovery of degraded ecosystems and delivery of ecosystem services (UNEP & F.A.O, 2020, 2023). This approach is wider than the traditional (classical) definition of restoration that call for the restoration of well-functioning ecosystems. However, restoration in the UNEP/UN Decade approach also includes activities such as mitigation and compensation, indicating a pragmatic realism about new development and further degradation of land also in the future.

Restoration is related to the concept of degraded land, and this is not an obvious and straightforward definition. The same situation (or state) can be viewed differently by different social groups. Two main lines of thought provide different definitions of degradation, one focusing on the reduced ability of the land to produce goods and services, and the other focusing on the function and capacity of natural ecosystems to recover. How and when restoration is needed and desirable will depend on the context defined by ecosystem condition, habitat, actors, and pressures. However, considering the UNCCD[18] definition, “degradation of land resources (including soils, water, vegetation, and animals) leading to a reduction in the capacity of the land to provide ecosystem goods and services and assure its functions over a period of time for the beneficiaries of these" (Bunning et al., 2011).

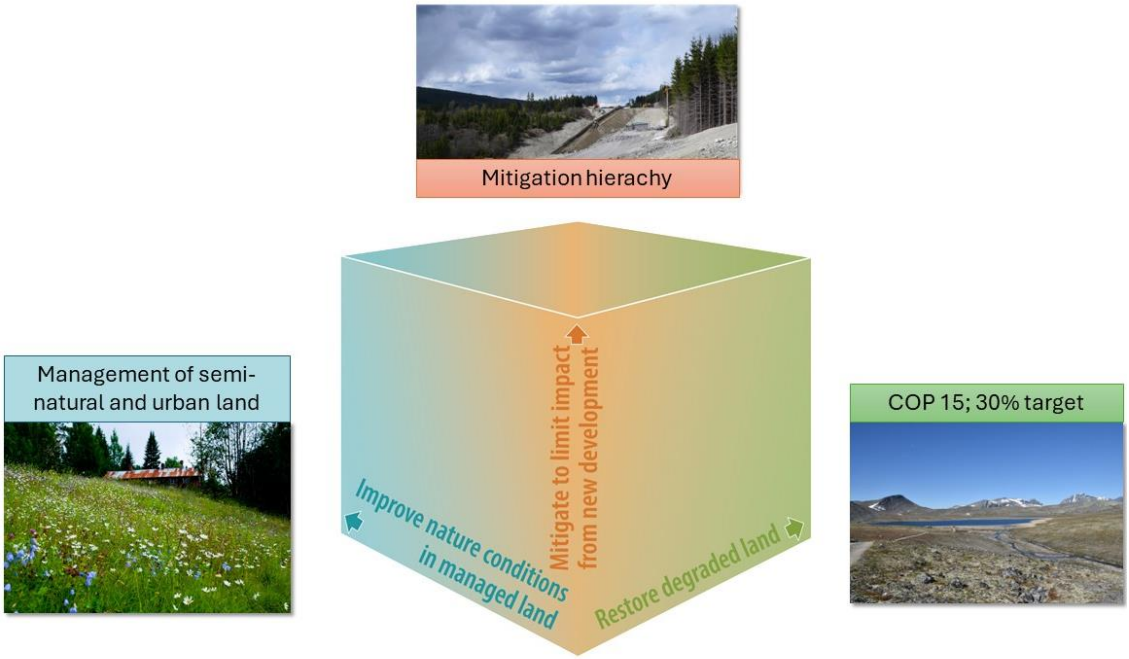
The space of restoration in this context includes a wide range of activities, addressing very different situations, different levels of degradation, and different restoration goals. One way of illustrating the “space of restoration” (Skrindo & Hagen, unpublished) is using three axes (Figure 2):

- Axis 1: restoration projects and interventions aiming for the restoration of well-functioning and self-sustaining ecosystems. These are the “classical” restoration projects to improve the ecological condition in degraded land.
- Axis 2: restoration techniques and solutions used to mitigate the negative impacts of nature and biodiversity in new development projects (along the mitigation hierarchy, including compensation, and aiming for no-net-loss).

[18] United Nations Convention to Combat Desetification

- Axis 3: actions and interventions that maintain and improve ecological conditions as well as improving the support of ecosystem services in urban or semi-natural areas. The goal is not to prepare for self-sustaining ecosystem, and these areas will need management to keep the qualities for biodiversity and goods.

Figure 2. Three axes in the "Restoration Space"



Source: Skrindo & Hagen (unpublished), illustrated in a Norwegian context, but valid across countries.

The three axes will generally operate at different levels of degraded land, and with different actors and professions. In the context of this report, this is relevant as the market analysis, and potential for making business will differ accordingly. In Norway, the restoration in Axis 1 (30% target) is normally operated and funded by regional and national environmental authorities. Private operators and businesses can be engaged on contracts for the implementation in the field, and sometimes in the planning and evaluation. Activities across the mitigation hierarchy (Axis 2) is normally funded by private developers and based on legal claims. Management of seminatural and urban areas (Axis 3) contains diverse projects, partly funded by agricultural subsidies, partly by environmental authorities (when involving rare species or habitat types), and partly by local authorities and commercial developers. The potential for private businesses operating Axis 2 and 3 is likely unexplored and underdeveloped.

Despite the different goals and actors, the methods and techniques used to plan, operate, and evaluate restoration can be exchanged across axes and situations. The exchange of knowledge and experience between projects is probably underexplored. Most likely, private businesses can make significant contributions to these projects, as they can work across scales, financing and authorities.

1.6.- Legal factors

Legal regulations provide positions, possibilities, and power to make restoration happen. However, legislation can also be a barrier for achieving restoration goals (UNEP & F.A.O, 2020). Land-use is governed by a collection of legislations. Restored land is a category of land-use that might conflict other types of land-use, such as agriculture, or renewable energy, and these types may be affected by other, and sometimes stronger legal regulations. One illustrative example from Norway is that conversion of agricultural lands into natural ecosystems (by restoration) is against the Norwegian Land Act, and this even applies when the agricultural land is out of regular production. Present and former agricultural land is thus commonly unavailable for restoration. However, in 2020, the Land Act was modified, so that new conversion of wetlands into agricultural land was no longer allowed. This change shows the shift towards legislation aimed at protecting and restoring wetlands.

An important number of laws and regulations are relevant for the implementation and upscaling of restoration. Some relevant regulations are listed in the following table (Table 5).

Table 5. Policies and strategies relevant for ecological restoration

Policy	Relevance for restoration
European Green Deal	Anchoring point for multiple strategies relevant at European level.
EU Climate Law	Legally binding a target of reducing emissions and climate neutrality.
EU Biodiversity Strategy	A long-term plan to protect nature and reverse the degradation of ecosystems
EU Forest Strategy for 2030	It recognises the central and multifunctional role of forests, and the contribution of foresters and the entire forest-based value chain for achieving a sustainable and climate neutral economy
EU Strategy on Green Infrastructure	Healthy green infrastructure should halt the loss of biodiversity and enable ecosystems to deliver their many services to people and nature, the

	strategy call for large scale planning and implementation.
EU Pollinators Initiative	To address the decline of pollinators in the EU and contribute to global conservation efforts.
EU Common Agricultural Policy	EU CAP can contribute to ER through enhanced conditionality and eco-schemes.
EU Nature Restoration Law	Should put 20% of the European land under ER by 2030 and all ecosystems in need of ER by 2050 and will make resources available to achieve this ambition.
Water Framework Directive	Setting out rules to halt deterioration in the status of EU water bodies and the obligation to restore rivers, lakes and groundwater to achieve good ecological status in degraded sites.

2. National analysis. Identification of key partners and key resources for the formation of new companies

Setting up a business is a long and complex process that involves overcoming several challenges, from conceptualisation to implementation. However, a number of support structures can facilitate this journey by providing access to a wealth of resources and knowledge, such as financial information, innovation, career guidance, market prospects and support for entrepreneurship. These include **key partners** such as government agencies, research institutes, local communities and entrepreneurship support agencies.

- Government agencies can provide new entrepreneurs with financial resources such as grants, loans and subsidies that can be crucial during the early stages of a business and provide information on tax incentives, credits and subsidies. They also help entrepreneurs avoid legal problems by providing guidance and resources to comply with local, regional and national regulations.
- Research institutes provide expertise that can help companies solve complex problems, improve their products and innovate, and often have advanced facilities to test and validate products, ensuring that they meet industry standards. They also conduct market research that can help new companies better understand their trends and needs.
- In contrast to government agencies, local communities provide valuable information and support for business start-ups in a locally relevant way. This information is related not only to financial and legal resources but also to local market research that can help the new entrepreneur match the characteristics of their business to local demand.
- Entrepreneurship support agencies can offer practical and strategic guidance to those who want to create their own business through mentoring programmes. They can also enhance entrepreneurs' skills through workshops and online courses on financial management, marketing, leadership and business planning. Finally, they also enable entrepreneurs to access private funding by allowing them to connect

with investors through Pitch events[19] and Demo Days[20], idea competitions, etc.

Also, and related to what has been seen so far, entrepreneurs need **key resources** to face challenges and to create and grow their business. Collaboration and networking opportunities allow them to foster strategic relationships and access new markets. For example, attending seminars and trade fairs allows entrepreneurs to meet other professionals, potential partners and customers, while access to specialised mentors within these networks can provide strategic guidance and emotional support. On the other hand, start-ups must have physical spaces, such as offices and shared spaces provided by incubators and accelerators or collaborative spaces through coworking and technological resources to help them carry out their activity.
As mentioned above, training is key at all stages of setting up a business. Continuing education offers different types of training in entrepreneurship from bachelor's to master's degrees, but there are also shorter courses and workshops that offer training in specific areas, as well as short-term intensive programmes that teach specific skills needed to launch and manage a business, such as entrepreneurship Bootcamps. Finally, entrepreneurs must be connected to community networks because community support and engagement not only enhances the reputation of the company, but also creates a favourable environment for sustainable growth.
Throughout this section we will illustrate the different support systems, institutional agencies and resources available for creating new companies and start-ups in the Czech Republic, Germany, Norway and Spain. Each country has a unique and tailored ecosystem to support the formation and growth of start-ups. Therefore, a detailed overview is provided of different websites that aspiring entrepreneurs can access for help, training, contacts and funding.

Czech Republic

At the national level, the Czech Republic has numerous resources to help those wanting to start a new business. The following table summarises the main organisations and websites that provide information, education and support for entrepreneurship:

[19] A Pitch is a concise presentation delivered by an entrepreneur to communicate the value proposition of their business to potential investors, partners or other stakeholders.

[20] A Demo Day is an event where startups showcase their products or services to a curated audience of investors, mentors, potential partners and other stakeholders.

Table 6. Key partners and Key resources for the formation of new companies in Czech Republic

KEY PARTNERS	Government Agencies	Official website of the Czech start-up scene:
	Research Institutions	Czech University of Life Sciences. New online course: Entrepreneurship: Turning Ideas into Business The Science and Technology Parks Association of the Czech Republic
	Local Communities	Support of innovation and entrepreneurship in the South Moravia region Support of Innovation and entrepreneurship in the Central Bohemian region
	Entrepreneurship support agencies	Official website of the Czech start-up scene (start-up support programmes, a list of incubation and acceleration programmes)
KEY RESOURCES	Networking and Collaboration Opportunities	Support of Innovation and entrepreneurship in the Central Bohemian region Official website of the Czech start-up scene Charles University Innovation Prague
	Infrastructure and Equipment	Official website of the Czech start-up scene
	Educational and Training Programs	Alevia company (unique e-modules in research and development) University of South Bohemia (lifelong learning) Lipka - educational institution for environmental training Czech University of Life Sciences. New online course: Entrepreneurship: Turning Ideas into Business

	Community Support and Engagement	

Germany

The following table lists organisations, educational centres, chambers of commerce, research centres and local communities in Germany that can provide information to new entrepreneurs on how to set up their business, especially in the state of Saxony-Anhalt. Each German state typically will offer similar types of resources.

Table 7. Key partners and Key resources for the formation of new companies in Germany

KEY PARTNERS	Government Agencies	· BMWK – Federal Ministry of Research and Education · BMWF – Federal Ministry for Economic Affairs and Climate Action · MWL – Ministry of Economic Affairs, Tourism, Agriculture and Forestry of the State of Saxony-Anhalt · BA – Federal Employment Agency · KFW – Credit Institute for Reconstruction · IB – Investment Bank Saxony-Anhalt
	Research Institutions	· Hochschule Anhalt University of Applied Sciences · Fraunhofer Institute · Helmholtz Institute · KAT – Centre for Applied and Transfer-Oriented Research
	Local Communities	· Landvernetzen · Netzwek Sachsen-Anhalt · Wirtschaftsjunioren Salzlandkreis · Startup Mitterldeutschland · Future Forest Initiative

	Entrepreneurship support agencies	· Research, Transfer and Start-up Centre of Anhalt University of Applied Sciences · Associated company Saxony-Anhalt mbH · Ventures AG · Chamber of Commerce and Industry · Chamber of handicrafts · Economic Development and Development Agencies Anhalt Bitterfeld · BAS-A – Business Angels Saxony-Anhalt · IMG – Investment and Marketing Corporation Saxony-Anhalt mbH
KEY RESOURCES	Networking and Collaboration Opportunities	· Various networks and initiatives (see local communities): - Networking events * Startup Fight Club (SFC) * Beach&Business * Meet the locals * REGIA Unternehmerinnenkonferenz - Pitch Events * Idea Cup * Pitch-Night
	Infrastructure and Equipment:	· Support and Funding Programmes - EXIST - Go-Bio · Diverse Incubators and Acceleration Programs - Digital office of FOUND IT!
	Educational and Training Programs	· Start-up centres of the universities of applied sciences and universities of Saxony-Anhalt · Innovation and start-up center · ISC – International Startup Campus (Leipzig, Halle, Jena)
	Community Support and Engagement	· Landvernetzen · Junior Chamber

Norway

As in all other countries, Norway also has a wide range of institutions that can provide information and help in setting up a new business. For example research institutions such as BI, NHH, HIV, NTNU, etc. Table 8 identifies organisations and institutions that can help support entrepreneurship, provide training and community engagement programmes in Norway.

Table 8. Key partners and Key resources for the formation of new companies in Norway

KEY PARTNERS	Government Agencies	Innovation Norway
	Entrepreneurship support agencies	Innovation Norway
KEY RESOURCES	Networking and Collaboration Opportunities	Altinn – Starting and running a business
	Infrastructure and Equipment:	Bank and insurance for green loans, funding start-ups, e.g. DNB or Danske Bank
	Educational and Training Programs	The Norwegian Directorate for Education and Training. The Norwegian School of Entrepreneurship
	Community Support and Engagement	NGO's Sabima

Spain

Below is some useful information for Spanish entrepreneurs who want to start a new business. The Spanish state is divided into autonomous communities and provinces, and each sub-national entity has its own entrepreneurship programmes, subsidies and grants, and its own policies. For clarity, the following table provides links to websites whose contents are relevant for entrepreneurs located in the Valencian Region. Similar sites exist in other Autonomous regions.

Table 9. Key partners and Key resources for the formation of new companies in Spain

KEY PARTNERS	Government Agencies	Entrepreneurship Portal of the Comunitat Valenciana Government
	Research Institutions	Enterprise/University Alicante Foundation
	Local Communities	Guide to entrepreneurship in municipalities
	Entrepreneurship support agencies	Entrepreneurship Agencies of the Comunitat Valenciana Local development agency in Alicante
KEY RESOURCES	Networking and Collaboration Opportunities	Business Incubators Comunitat Valenciana
	Infrastructure and Equipment	Grants to support entrepeneurs and SMEs
	Educational and Training Programs	Center for Enterprises and Innovation
	Community Support and Engagement	Emprendeverde Network

3. Detailed Analysis of Ecological Restoration as a Business Model.

Ecological restoration plays a critical role in repairing damaged landscapes and promoting environmental health. As global awareness of environmental challenges grows, the demand for ecological restoration activities is expected to rise significantly. To understand this evolving context, TEAM#UP conducted a survey within the partner countries (Germany, Spain, Norway and Czech Republic) to gather valuable insights from companies operating in the ecological restoration "sector".

For this purpose, TEAM#UP elaborated a database with public, private companies and NGO´s already working in the ecological sector. The database was created trying to ensure that the sample was representative in the E.R as a whole. This targeted approach allowed to include a diverse range of organisations, from large to small and medium-sized companies, thereby capturing a comprehensive picture of the sector.

The survey based on a questionnaire (see Appendix 3), explored various aspects of organisations (private and public companies and non-government organisations operating in ecological restoration) including:

3.1.- Company profile: company size, experience, geographic reach, and areas of specialisation.

3.2.- Market structure and trends: market structure, level of competition, emerging trends.

3.3.- Barriers of entering ecological restoration. Aimed to understand the challenges faced by new entrants into the ecological restoration market.

3.4.- Business model and revenue streams: understanding how the companies generate revenue, types of services offered.

3.5.- Sources of funding and financial resources: it explores how companies secure funding for restoration projects.

3.6.- Competitive rivalry: The survey aims to identify key factors influencing competition in this field.

3.7.- Education, knowledge and skills development: Exploring the perspective on the current level of training and education on ecological restoration solutions of practitioners.

Table 10. Summary of data collection

Features	Questionnaire
Target	Organisations in Ecological Restoration and NGOs
Geographical scope	Spain, Norway, Germany and Czech Republic
Sample size	79 validated responses
Data collection	Mail
Sampling design	Random sampling
Data	From 27th March to 10th May 2024

Data analysis. The analysis of the information consisted of:

- The systematisation and processing of the information received.
- The elaboration of dynamic tables, with filters according to the characteristics of the information to be interpreted in each of the questions.
- Graphical representation of results for their interpretation.
- Analysis of the functional perspective according to factor.

3.1.- Company Profile

This section of the questionnaire aims to collect fundamental data about the company´s structure, size, geographical reach and areas of specialisation. Understanding the unique characteristics of each organisation is essential for creating a comprehensive overview of the E.R profile. The main objective is to build a clearer picture of the diverse range of entities operating within the E.R.

Table 11. Total responses received to the questionnaire per country

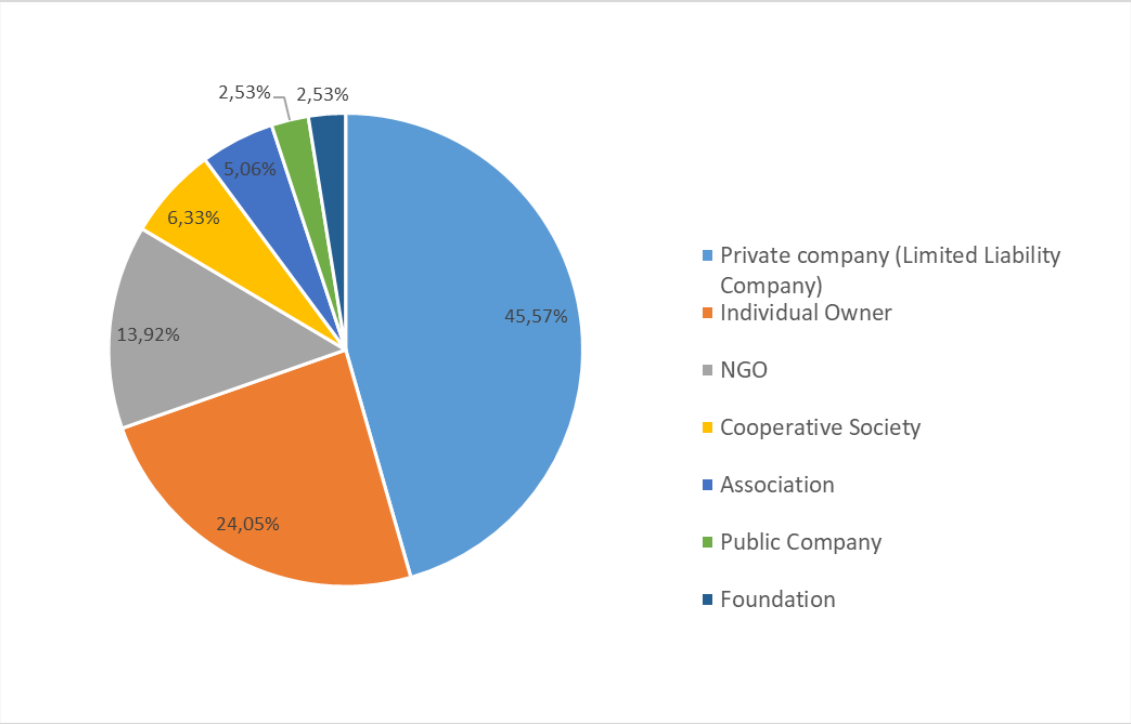
Country	Replies by country
Germany	30 (38%)
Spain	25 (32%)
Norway	13 (16 %)
Czech Republic	11 (14%)
Total	79

Geographically, the sample includes responses from 79 organisations from the consortium member countries from Germany (38%), Spain (32%), Norway (16%) and Czech Republic (14%).

Legal Form[21]

The data highlights the diverse organizational landscape of ER across different countries. Private companies are generally the most prevalent form (46%), followed by individual owners (24%) and NGOs (14%). The variations between countries indicate differing cultural, economic and regulatory environments that influence how ecological restoration activities are organized and implemented. This analysis underscores the importance of understanding local contexts when developing strategies for ecological restoration and related business ventures.

Figure 3. Percentage representation of responses received on the legal form of the company (all countries)

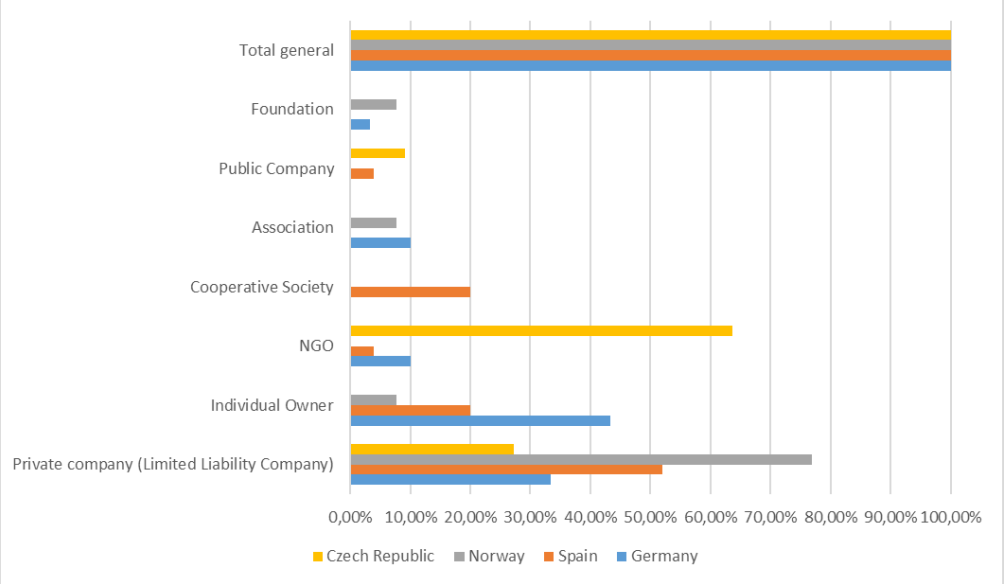


Germany has a relatively balanced distribution, with a significant portion of activities carried out by individual owners (43%) and private companies (33%). NGOs and associations also play a role, but to a lesser extent, while cooperative societies and public companies where absent in this data set.

In **Spain**, private companies dominate the sector (52%) followed by individual owners (20%) and cooperatives (20%). NGOs and public companies have minimal presence, and associations and foundations are absent in this context.

[21] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52009IE1454

Figure 4. Legal form by country



Norway shows a strong preference for private companies (77%) as the main organizational form. There is a minimal involvement from individual owners, associations and foundations and no presence of NGOs, cooperative societies or public companies.

The **Czech Republic** is unique in that NGOs dominate the sector (64%). Private and public companies also have a presence, but there is no other type of legal forms according to the sample.

Stage of Growth

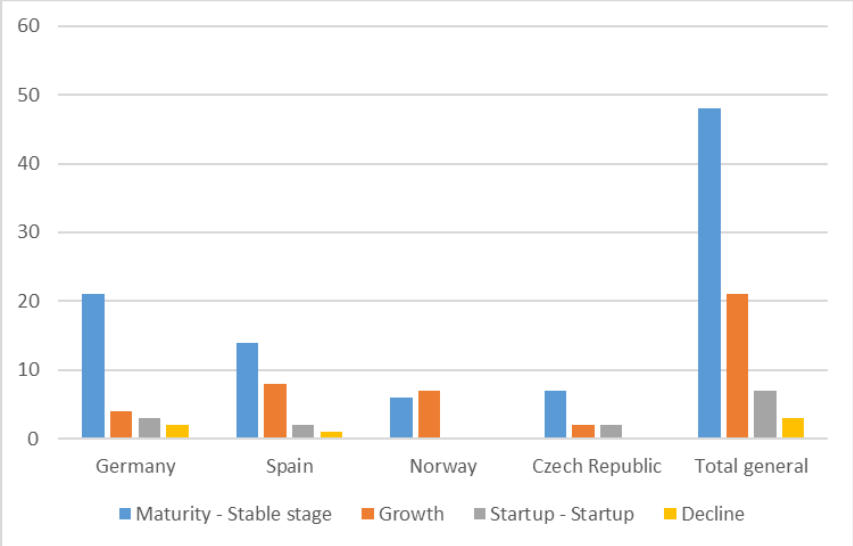
The ecological restoration sector is largely characterized by mature and stable companies, reflecting an established market with a solid foundation. However, the presence of companies in the growth stage across all countries suggests robust expansion and scaling activities, signalling a vibrant and evolving sector.

Table 12. Stage of growth of the surveyed companies

What stage of growth is your company in?	Maturity - Stable	Growth	Startup	Decline	Total
Germany	21	4	3	2	30
Spain	14	8	2	1	25
Norway	6	7	0	0	13
Czech Republic	7	2	2	0	11

Total general	**48**	**21**	**7**	**3**	**79**
Stage of Growth	61%	27%	9%	4%	100%

Figure 5. Stage of growth per country



The existence of startups, particularly in the Czech Republic, underscores ongoing innovation and entry of new players into the market. The small number of companies in decline highlights the sector's overall health and resilience. Entrepreneurs and investors can view this sector as both stable and promising with opportunities for growth and innovation.

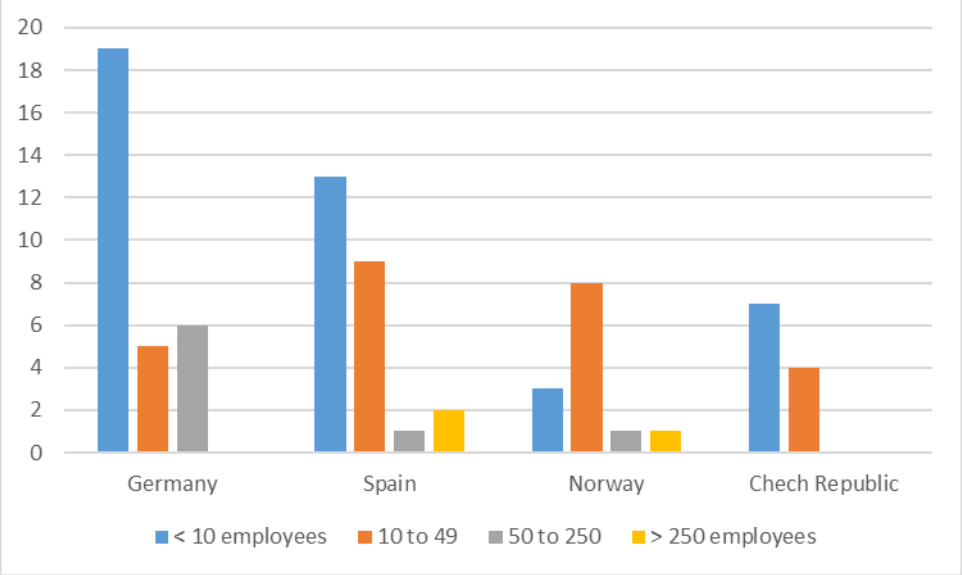
Size – by number of employees and by turnover

The analysis of the Size in the context of Ecological Restoration companies provides information about the operational scale (capacity) of these businesses. The **number of employees** serves as an indicator of the workforce involved in the activities, reflecting the labour-intensive nature of the sector. The **turnover** reveals the financial performance and revenue-generating capabilities of the businesses, offering a glimpse into their economic viability and growth potential. Together, these indicators help paint a comprehensive picture of the scale at which ecological restoration companies operate, informing strategic decisions for stakeholders and new entrepreneurs.

Table 13. Company size by number of employees

Number of Employees	< 10 employees	10 to 49	50 to 250	> 250 employees	Total general
Germany	19	5	6	0	30
Spain	13	9	1	2	25
Norway	3	8	1	1	13
Chech Republic	7	4	0	0	11
Total general	**42**	**26**	**8**	**3**	**79**
Size	53%	33%	10%	4%	100%

Figure 6. Company size by number of employees per country



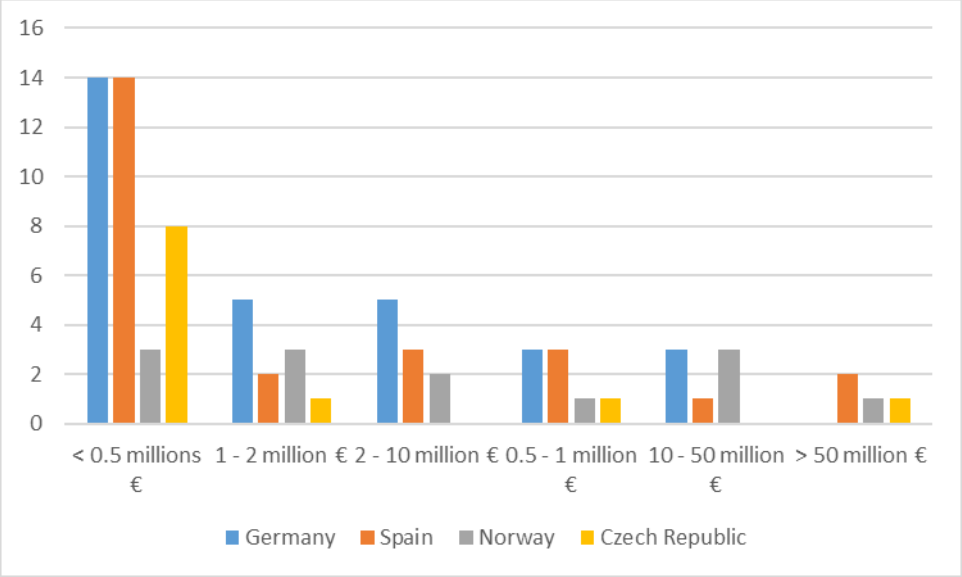
This data reveals that ecological restoration is largely composed by small companies, with over half of the companies having fewer than 10 employees. This highlights the entrepreneurial nature of the sector, with small businesses involved in various restoration activities. There is also a significant presence of companies between 10 to 49 employees, which shows a healthy segment of small to medium companies that are capable of scaling up their operations. This context represents new business opportunities for new entrants. Small companies often thrive in niche markets. Identifying and specializing in specific areas-niche markets of ecological restoration can provide competitive advantages for new startups. With a scope of many small "players", **building partnerships and collaborations** can lead to shared resources, knowledge exchange, and joint ventures that enhance project capabilities and innovation, which can be a motivation to attract investment. On the contrary, many small companies may face **resource constraints**, such as limited access

to capital, skilled labour and advanced technology which can hinder growth and competitiveness. As the sectors grows, larger companies with more resources may enter the market, increasing competition and potentially pushing out smaller players unable to compete on price and scale with them.

Table 14. Company size by turnover

Country	< 0.5 million €	1 - 2 million €	2 - 10 million €	0.5 - 1 million €	10 - 50 million €	> 50 million €	Total general
Germany	14	5	5	3	3	0	30
Spain	14	2	3	3	1	2	25
Norway	3	3	2	1	3	1	13
Czech Republic	8	1	0	1	0	1	11
Total general	**39**	**11**	**10**	**8**	**7**	**4**	**79**
Turnover	49%	14%	13%	10%	9%	4%	100%

Figure 7. Turnover representation by country



Nearly half of the companies (49.37%) have a **turnover** of less than 0.5 M€, indicating that many businesses in ecological restoration are small-scale operations with limited revenue, as mentioned above. The distribution shown in Table 14 suggests potential for entrepreneurial ventures to scale up and capture more market share. The sector´s growth potential is evident, even in countries like Norway, where there is a more balanced distribution of

company turnovers across various ranges. Table 15 provides a comprehensive picture of the economic engagement and specialization in the E.R companies in the sample.

Table 15. Percentage of Turnover in Ecological Restoration

% of turnover in Ecological Restoration	< 25 %	25% - 50%	50% - 75%	> 75%	Total general
Germany	5	9	9	7	30
Spain	18	5	1	1	25
Norway	8	4	1		13
Czech Republic	2	4	2	3	11
Total general	**33**	**22**	**13**	**11**	**79**
	42%	28%	16%	14%	100%

In Germany, companies are diversified in their turnover, with significant representation across all categories. This suggests a mature market where businesses are integrating ecological restoration into their core operations. In Spain and Norway, most companies generate less than 25% of their turnover from ecological restoration. This result indicates that there is room for increasing the contribution of this sector to their total turnover and reflects the existing potential for market development. For future entrepreneurs, this low integration highlights opportunities to enter the ecological restoration market. In the Czech Republic, companies show a balanced distribution, with a significant percentage of companies generating more than 75% of their turnover in ecological restoration.

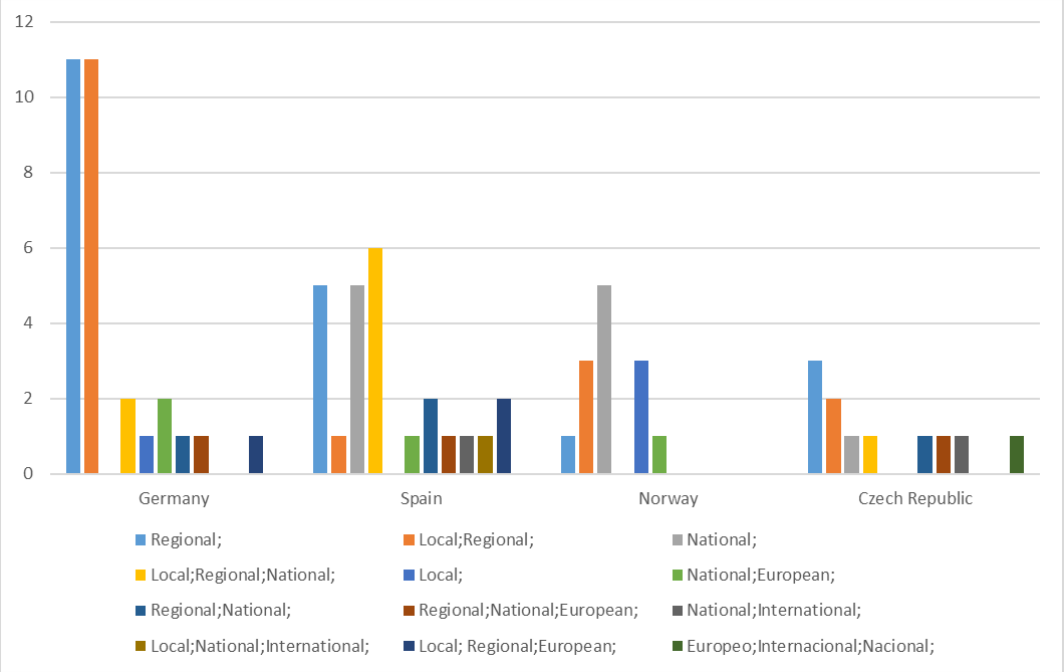
3.2.- Market Structure

This section aims to explore the key factors that shape the market, including demand drivers, the experience in years the respondents have, and the channels of information companies use to keep inform about the regulatory changes and emerging trends. With the analysis the insights will provide a comprehensive picture on how the market operates.

Table 16. Distribution of responses by country according to target market

Target Market	Germany	Spain	Norway	Czech Republic	Total general
Regional	11	5	1	3	20
Local;Regional	11	1	3	2	17
National	0	5	5	1	11
Local; Regional; National	2	6	0	1	9
Local	1	0	3	0	4
National;European	2	1	1	0	4
Regional;National	1	2	0	1	4
Regional;National;European	1	1	0	1	3
Local; Regional;European	1	2	0	0	3
National;International	0	1	0	1	2
Local;National;International	0	1	0	0	1
National; European;International	0	0	0	1	1
Total general	**30**	**25**	**13**	**11**	**79**

Figure 8. Target market per country



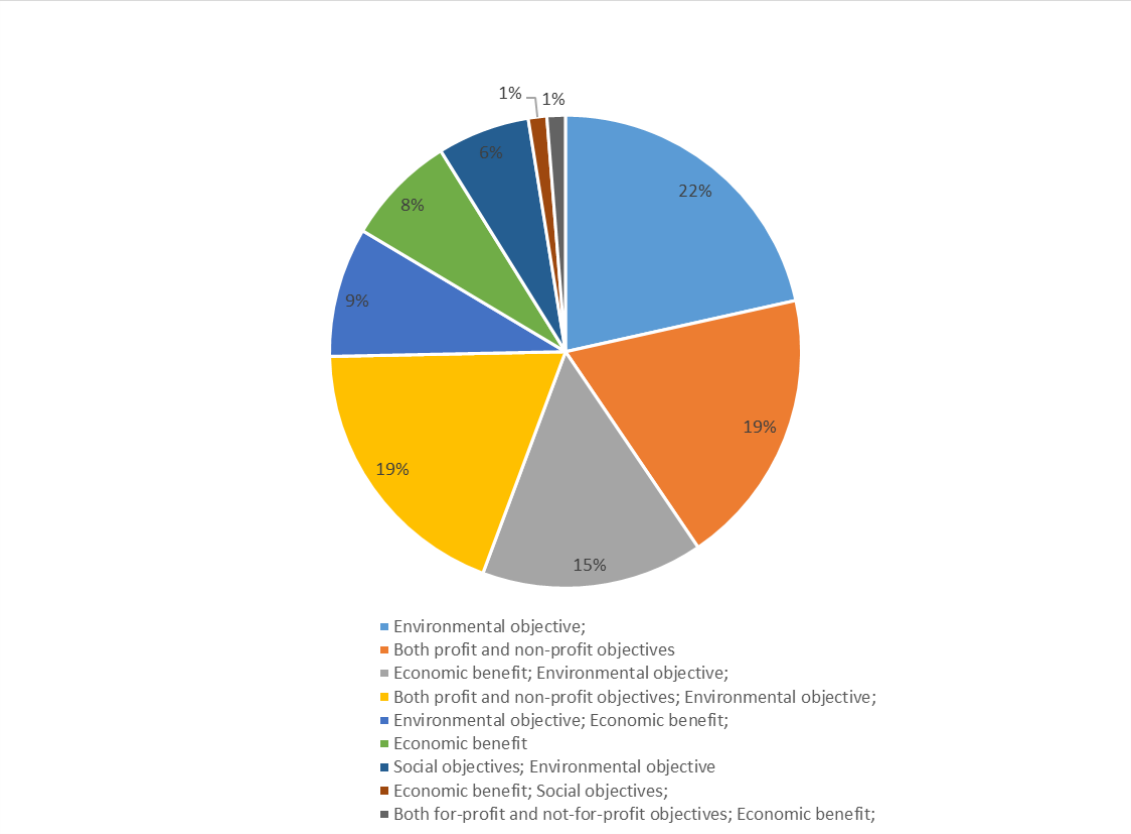
The regional market is the predominant focus across all countries, with 20 out of 79 companies (25%) primarily operating regionally. This data indicates **robust local demand** and potential for growth. Entrepreneurs can leverage regional networks and resources to establish and expand their business. The broad range of market focuses suggests that companies in ecological restoration are adaptable and can operate effectively at multiple scales (local to international). The varied market focuses also highlight the need for flexible business strategies. Entrepreneurs should consider multi-tier market approaches to maximize the reach and impact.

Table 17. Distribution of responses according to main business objective

Main business objective	
Environmental objective	17
Both profit and non-profit objectives	15
Both profit and non-profit objectives; Environmental objective	15
Economic benefit; Environmental objective	12
Environmental objective; Economic benefit	7
Economic benefit	6
Social objectives; Environmental objective	5
Economic benefit; Social objectives	1
Both for-profit and not-for-profit objectives; Economic benefit	1
Total	**79**

The main objectives of the companies are categorized into environmental objectives, economic benefits, social objectives and combinations of these. We find a strong alignment of environmental goals with economic incentives (22%). Entrepreneurs can explore this insight to create sustainable business models. There is also an opportunity to further integrate social objectives into ecological restoration projects addressing community needs and enhancing the social impact of environmental initiatives.

Figure 9. Percentage of responses according to the main objective of the business



Main services provided

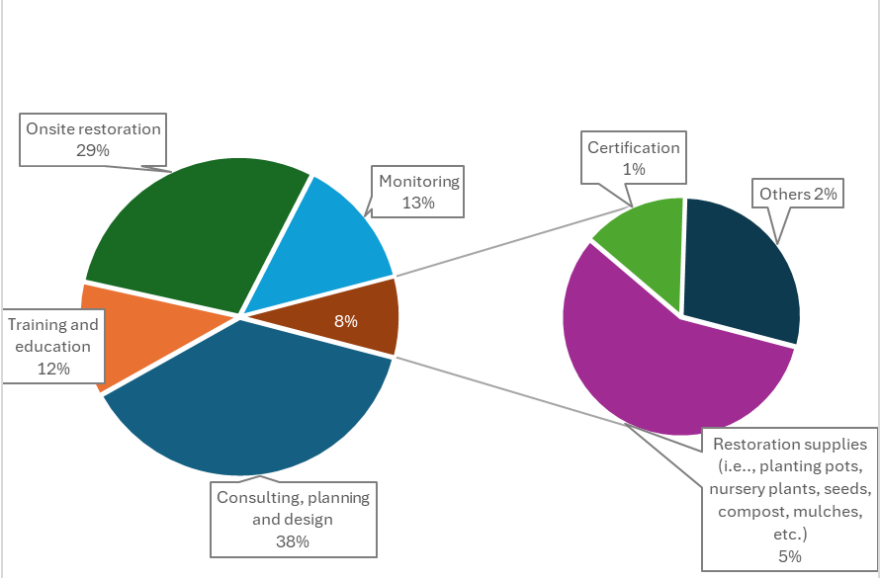
More than one third of the companies (38%) provide Consulting, Planning and Design services, suggesting that clients require expert guidance in the early stages of their projects. The importance of practical implementation in the field was mentioned by 29% of the respondents, indicating that many companies are actively involved in hands-on restoration activities. Supplementary services include Training and Education (12%) and Monitoring (13%). It also shows niches and underrepresented services related to

Restoration Supplies (5%), Certification (1%) and other services that include practical project implementation, construction of infrastructure and special reports. The small percentage dedicated to Certification may show that Certification is not yet well established, which has further implications on the quality and standardization of restoration practices. These niche services represent the diverse needs within the ecological restoration.

Table 18. Distribution of responses according to the main services provided

Main services provided	Answers		
Consulting, planning and design	65		
Onsite restoration	50		
Monitoring	23		
Training and education	20		
Restoration supplies (i.e.., planting pots, nursery plants, seeds, compost, mulches, etc.)	8		
Certification	2		
Legal services	0		
Others	4	Practical projects and implementation with clients on site	1
n*	**172**	Construction of infrastructure according to customer requirements	1
		Services	1
		Special Reports	1

Figure 10. Percentage of main services provided



Sector: Main sector and other sectors involved

Biodiversity Conservation was the main market sector (41%), which indicates a significant demand for services that protect and restore diverse ecosystems. Specialized ecological restoration Services (ERS) (39%), specially ERS in Infrastructures, Woodlands, Rivers and Wetlands. Sustainable Forestry with 8% (Table 19).

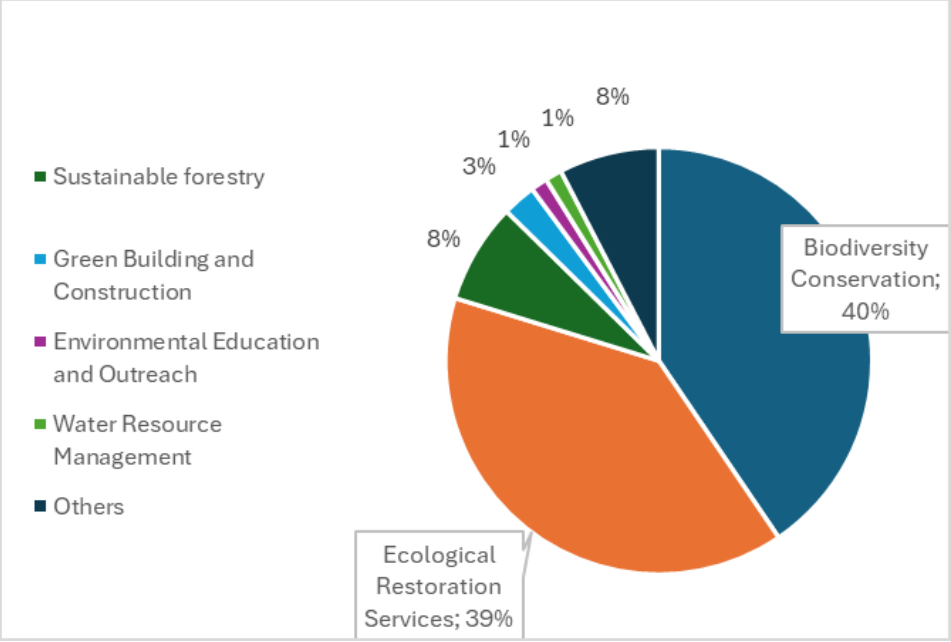
Table 19. Distribution of responses according to the main market sector

Main market sector	Answers
Biodiversity Conservation	32
ERS:Wetlands	6
Sustainable forestry	6
ERS:Infrastructures (roads, railways, power lines)	5
ERS:Woodlands (including forests, shrublands, steppes, grasslands)	5
ERS:Rivers	4
ERS:Mining	3
ERS:Urban and periurban seettings	3
Ecological Restoration Services (ERS)	2
ERS:Peatlands	2
Green Building and Construction	2
Water Resource Management	1
ERS: Agroecosystems	1

Environmental Education and Outreach	1
Carbon offsetting and trading	0
Renewable energy production	0
Others	6
n	**79**

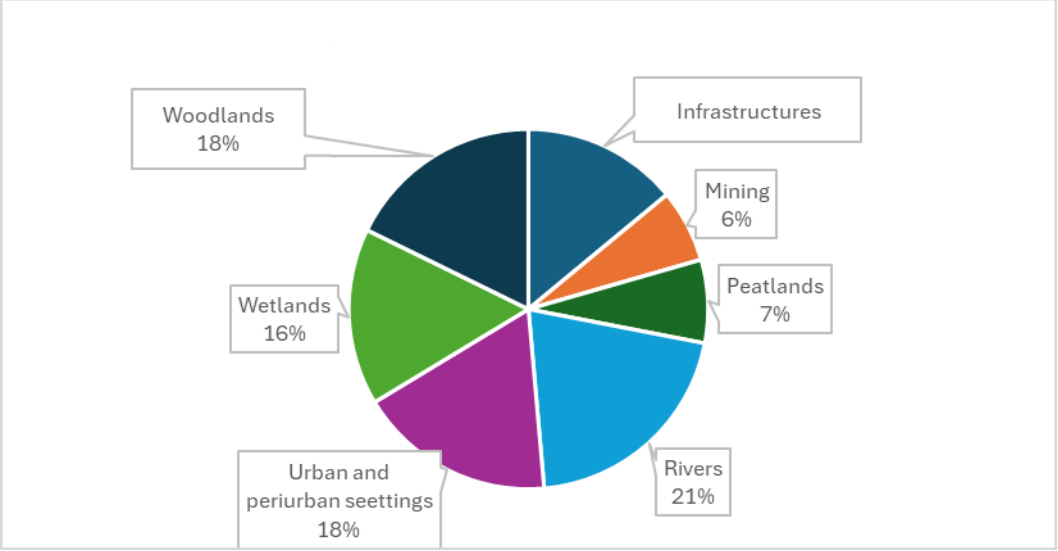
Environmental assessment	1
Marine environmental consultancy	1
Environmental consultancy	1
Emergency planning	1
Natural design	1
Horticulture	1

Figure 11. Percentage of responses by main market sector



As secondary interventions, results show that ERS are the most significant sector with 107 responses, followed by Biodiversity Conservation.

Figure 12. Percentage of responses according to other market sectors



The ecological restoration sector is characterized by its diversity and broad range of services, addressing various environmental, social and economic objectives. Data reveals a potential gap in areas like Renewable energy production and Green Building and Construction. New entrepreneurs could focus on integrating ecological restoration services in order to minimize environmental impact and promote habitat creation.

Table 20. Distribution of responses by sector of activity

Grouped		ERS	
Ecological Restoration Services (ERS)	107	Rivers	22
Biodiversity Conservation	33	Urban and periurban seettings	19
Environmental Education and Outreach	26	Woodlands	19
Agroecosystems	25	Wetlands	17
Green Building and Construction	11	Infrastructures	15
Sustainable forestry	9	Peatlands	8
Water Resource Management	8	Mining	7
Carbon offsetting and trading	7		
Renewable energy production	3		
Others	5		

Years in the Market

Table 21. Distribution of responses by years of business activity

Number of Years of Activity	Answers
Less than 3 years	4 (5%)
Between 3 and 10 years	19 (24%)
More than 10 years	56 (71%)
n	**79**

Reporting on the **Number of Years** in the market show that companies are predominantly composed of well-established organisations with extensive experience in the ecological restoration market. Yet, there is also a notable presence of emerging companies that contribute to sectoral growth and innovation. While the entry of new organisations is relatively limited, those that do enter the sector are likely highly motivated and capable of overcoming significant barriers. This mix of stability and innovation bodes well for the sector´s ability to address complex environmental challenges through ecological restoration practices.

Table 22. Average ranking of the market demand

Rating market demand in Ecological Restoration sector	Answers
1 Strong Decrease	2
2	10
3	24
4	27
5 Strong Increase	16
n	**79**
Average Ranking	**3,57**

Average ranking of the market demand is 3.57 out of 5, which leans towards an **increase in market demand**. This suggests a generally positive outlook within the sector regarding future demand. The majority of respondents (43-ranking 4 and 5, 54%) believe that market demand is increasing, indicating optimism about the growth potential and opportunities within the ecological restoration sector. Another significant portion (30%) of the answers view the market demand stable. This stability can be beneficial for long term planning and investment, providing a consistent foundation for businesses operating in this sector.

The perception of increasing market demand can attract new entrants to the sector, fostering competition and innovation. On the other hand, as market demand increases, so does competition. In order to cope with this, companies will need to differentiate themselves through innovation, quality and efficiency.

Table 23. Average ranking of the company's demand

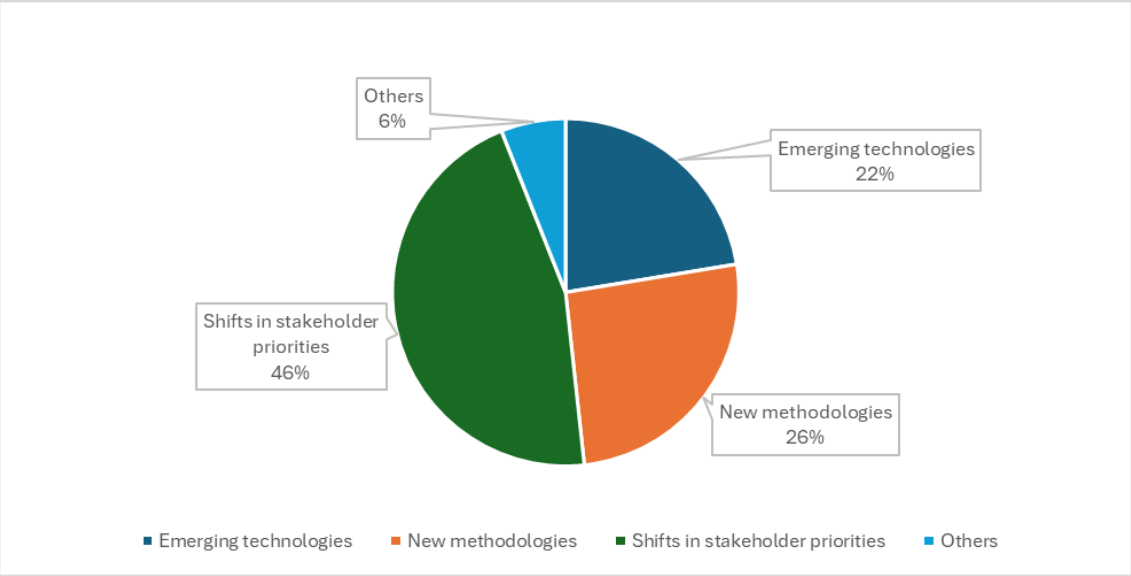
Rating of the company's demand	Answers
1 Strong Decrease	2
2	5
3	26
4	27
5 Strong Increase	19
n	**79**
Average Ranking	**3,71**

The comparative analysis between the market demand (3.57 out of 5) and the company demand (3.71 out of 5) shows that individual companies are having a slightly higher confidence level perception. This perception indicates that businesses are feeling confident about their demand prospects. Companies should remain vigilant and adaptable to sustain this positive trend about market dynamics and potential competition.

Main opportunities for products/services in the upcoming years

The respondents see significant potential in Emerging technologies (22%) and New methodologies (26%), suggesting a focus on innovation and the adoption of best practices. The most substantial opportunity lies in the shifting priorities of stakeholders (46%), indicating a growing recognition and support for ecological restoration efforts.

Figure 13. Main opportunities for products and services identified by survey respondents

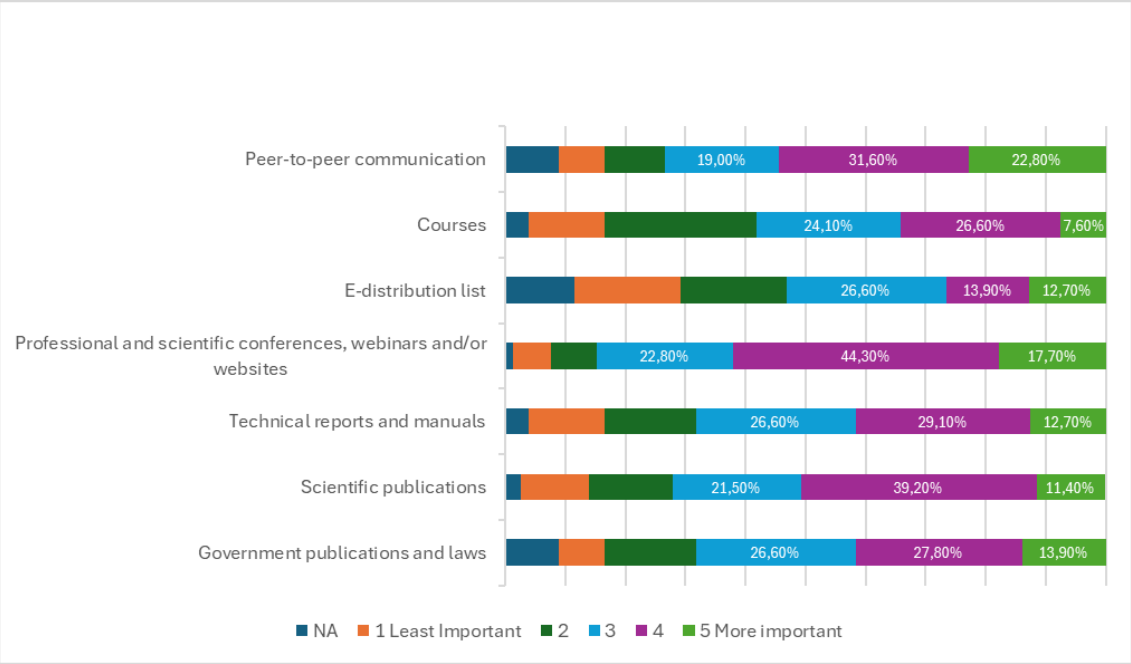


Changes in Legislation and Regulatory Frameworks are also seen as critical drivers for the sector, potentially creating new mandates and funding sources for restoration projects. Other responses highlight the multifaceted nature of opportunities, from business demands for sustainability to re-naturalization efforts.

Networks to keep informed

As mentioned above, companies should keep informed about the changes and trends in the market. With this regard, Table 22 shows the networks commonly integrated in companies. The data shows the distribution of responses across different level of importance for each type of networks.

Figure 14. Networks to keep informed about current and emerging trends in the sector



Professional and Scientific Conferences, Webinars and Websites with 85% and Peer-to-peer communication (73%) of the answers considering them important (rates 3-4-5) are the most highly valued and critical sources for staying informed about trends and highlights the importance of continuous learning and networking.

3.3.- Barriers to new entrants

This section of the survey focuses to understand the challenges and obstacles that new entrants face when trying to enter the sector. It analyses barriers in regulatory hurdles, the initial investment costs, the access to specialized knowledge or the access to finance.

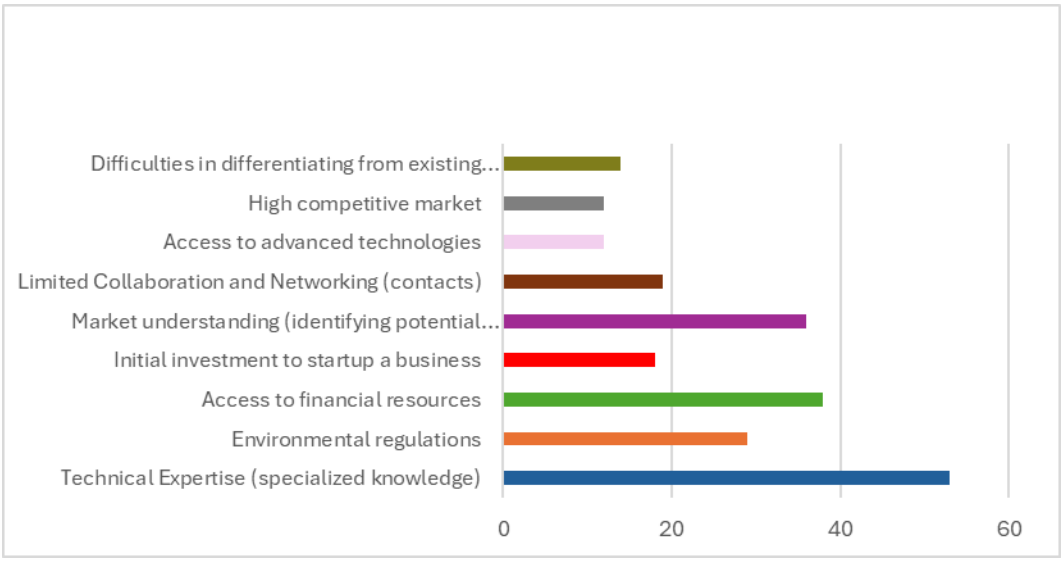
Respondents perceived the need for **specialized knowledge** as the most significant barrier for new entrants, indicating that expertise in ecological restoration is crucial for entry and success in this field. **Access to financial resources** and the initial capital investment required represent major hurdles, which reflect the capital-intensive nature of the ecological restoration projects. Understanding the market, navigating environmental regulations and differentiating from competitors are also key challenges, pointing to the complexity of establishing a viable business model. Finally, the limited collaboration opportunities and access to advanced technologies also

represent barriers and underscore the importance of building networks and leverage new technologies.

Table 24. Distribution of responses according to the main barriers identified for entering into the ecological restoration business

Main barriers for entering in the ecological restoration business activity	Answers
Technical Expertise (specialized knowledge)	53
Access to financial resources	38
Market understanding (identifying potential clients, and developing a sustainable business model)	36
Environmental regulations	29
Limited Collaboration and Networking (contacts)	19
Initial investment to startup a business	18
Difficulties in differentiating from existing competitors.	14
Access to advanced technologies	12
Highly competitive market	12
n	**111**

Figure 15. Main barriers to entry into the ecological restoration business activity



3.4.- Business Model

This section of the survey tries to explain how companies in the ecological restoration generate revenue and sustain their operations. This part of the questionnaire investigates the various types of services offered by the companies, it examines the price strategies and the revenue models they employ. This analysis will identify business practices and can provide a comprehensive overview of how the companies in the sample structure their operations to create and capture value.

There is a large diversity of business models[22], three of them (B2G, B2B and B2C) characterizing the highest number of companies. Across partners countries, the **B2G model** was prevalent (Table 25, Fig. 24). This highlights the critical role of government projects and funding in the ecological restoration sector. Companies targeting this market likely benefit from stable, large-scale contracts but may also face bureaucratic challenges and regulatory compliance issues. The significant use of the **B2B[23] model** also highlights the importance of inter-business collaborations. These partnerships can drive large projects and create synergies between different expertise areas, fostering a holistic approach to ecological restoration. Although less dominant, the **B2C model** indicates a viable market for individual consumers interested in this area. Companies adopting this model might focus on personalized services and educational outreach to attract and retain clients. While not widely adopted, the presence of the **B2B2C model** shows that hybrid approaches can bridge business collaborations with direct consumer engagement, offering flexibility and potentially broader market reach. Surprisingly, only 2.5% of the companies were characterised by the **P2P/C2C models**. This points to grassroots and community-driven initiatives. This model may become more relevant as public awareness and interest in ecological restoration grow.

---

[22]

B2B (Business to Business): Company that markets to other companies

B2C (Business to Consumer): Company that sales to the final consumer

B2B2C (Business to Business to Consumer): Company that sells to the final consumer through an intermediary company

B2G (Business to Government): Company that sells to government

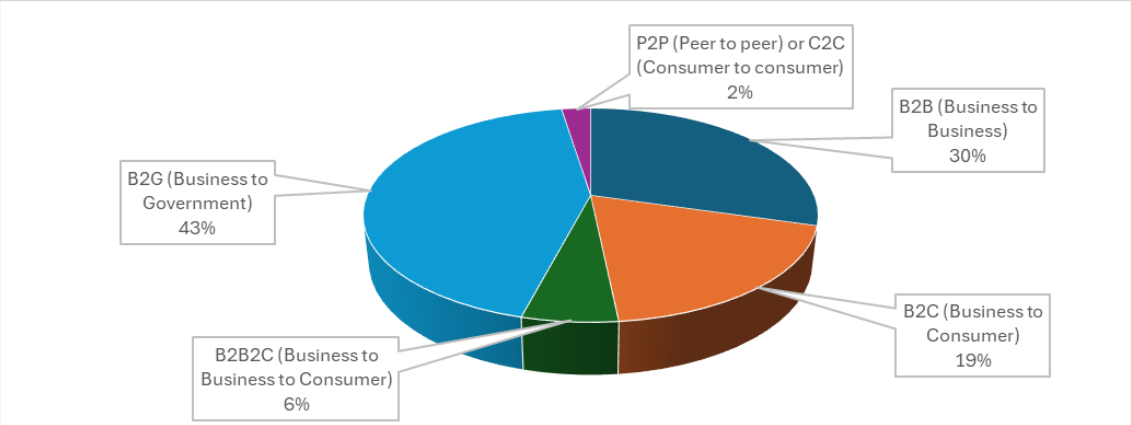
P2P (Peer to peer) or C2C (Consumer to consumer): Company designed to facilitate a transaction between 2 individual users. Usually in a marketplace model

[23] B2B is a transaction between businesses/companies.

Table 25. Distribution of responses according to business model

Main model[24]	Answers
B2G (Business to Government)	53
B2B (Business to Business)	36
B2C (Business to Consumer)	23
B2B2C (Business to Business to Consumer)	7
P2P (Peer to peer) or C2C (Consumer to consumer)	3
n	**122**

Figure 16. Percentage distribution of business models



In terms of **Value Proposition**, companies prioritize **Quality** and **Innovation**. These propositions are seen as critical to maintaining a competitive edge and satisfying client demands. **Customization** is also a key differentiator for some companies. In contrast, **Price** and **Cost reduction** are not primary value propositions. This reflects a focus on differentiation as a competitive strategy delivering high-value, quality services over competing on cost or price.

24

B2B (Business to Business): Company that markets to other companies

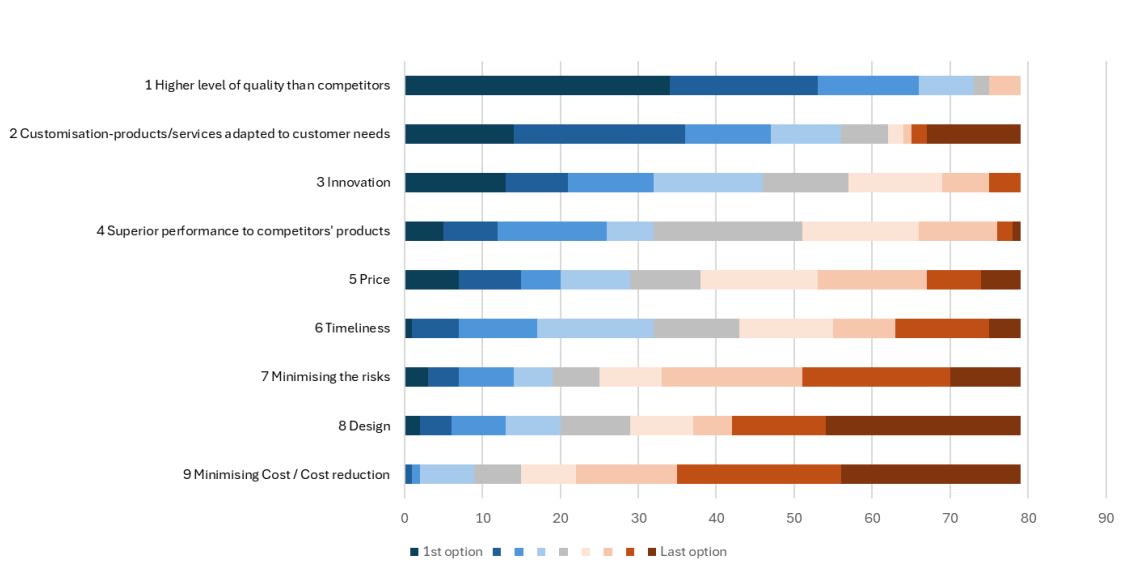
B2C (Business to Consumer): Company that sales to the final consumer

B2B2C (Business to Business to Consumer): Company that sells to the final consumer through an intermediary company

B2G (Business to Government): Company that sells to government

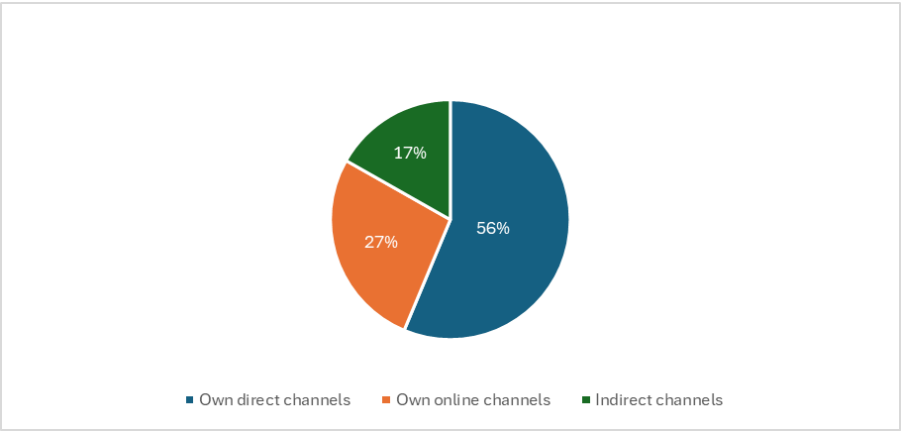
P2P (Peer to peer) or C2C (Consumer to consumer): Company designed to facilitate a transaction between 2 individual users. Usually in a marketplace model

Figure 17. Distribution of responses according to main value proposition



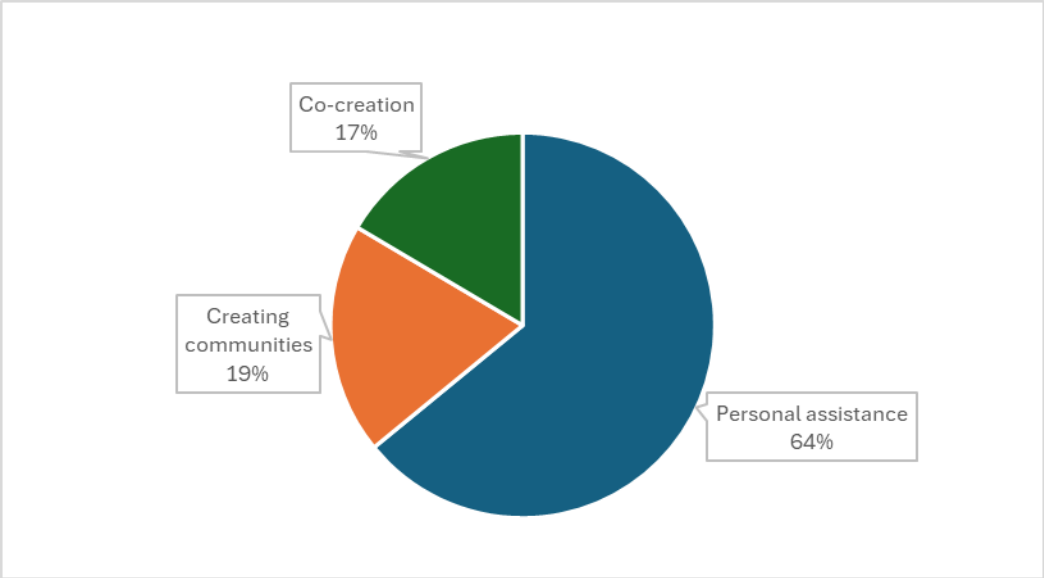
Analysing the **Channels of Distribution**, most businesses prefer **direct and personal engagement** with their clients, whether through direct channels or personal meetings. This approach likely helps in maintaining quality control and building strong client relationships. A significant number of the companies utilize **online channels**, highlighting the growing importance of digital strategies in the ecological restoration sector. While not as widely applied as direct methods, indirect channels play a crucial role. Methods like subcontracting, referrals, and collaborations help businesses reach new clients and opportunities they might not access directly. The diversity expressed in the indirect channel strategies suggests that businesses are flexible and adaptive, using a combination of methods to effectively distribute their services and reach their target audience.

Figure 18. Main distribution channels detected



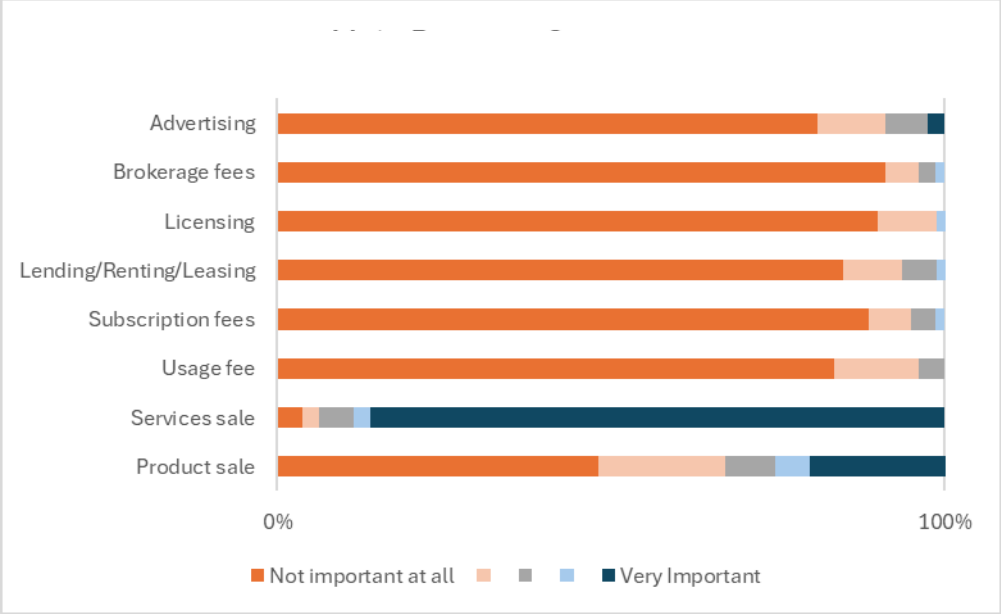
The **main Customer Relationships for the studied companies** underscore the importance of direct, personalized interaction with clients. The predominant Customer Relationship (Personal Assistance), highlights the sector's commitment to offering personalized and attentive service. It is a **client-centric approach**, that may help in addressing specific client needs and building strong, trust-based relationships. Yet nearly one-fifth of businesses focus on **creating communities**, indicating an understanding of the power of collective engagement. This strategy helps in building a loyal customer base and facilitates peer-to-peer support among clients. The presence of co-creation as a significant customer relationship model demonstrates that some companies are keen on leveraging customer insights and ideas to enhance their offerings. This approach not only improves product development but also strengthens customer loyalty by making clients feel valued and involved.

Figure 19. Main customer relationship



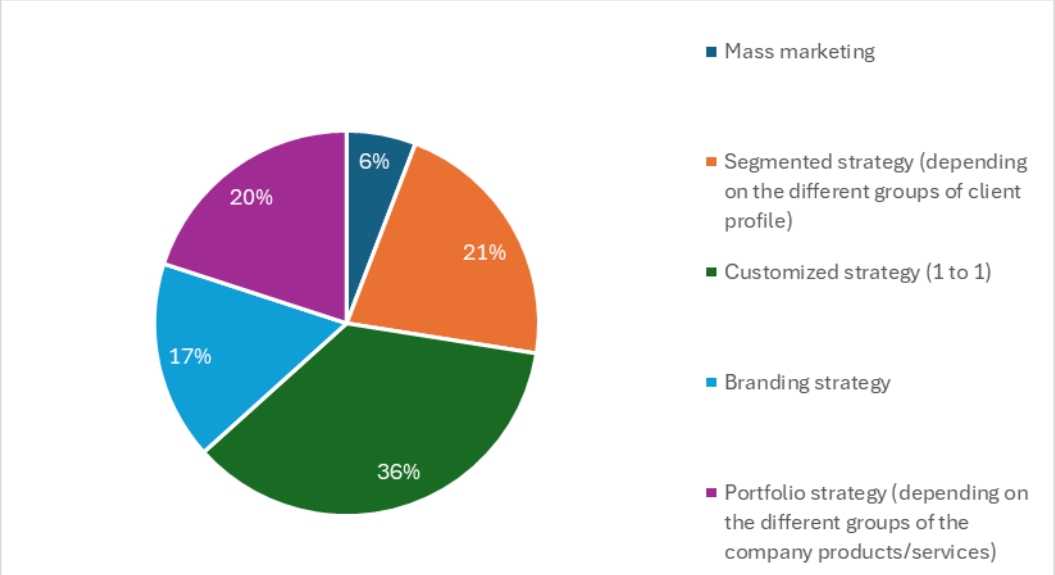
Service sales are by far the most important **revenue stream**, with 86% of respondents selecting this option. This reflects the sector's emphasis on specialized knowledge and personalized service delivery. Alternative revenue models are not widely adopted (Fig. 28). Interestingly, product sales, while important for some, are not the primary focus for the majority of respondents in the sample.

Figure 20. Main revenue Streams



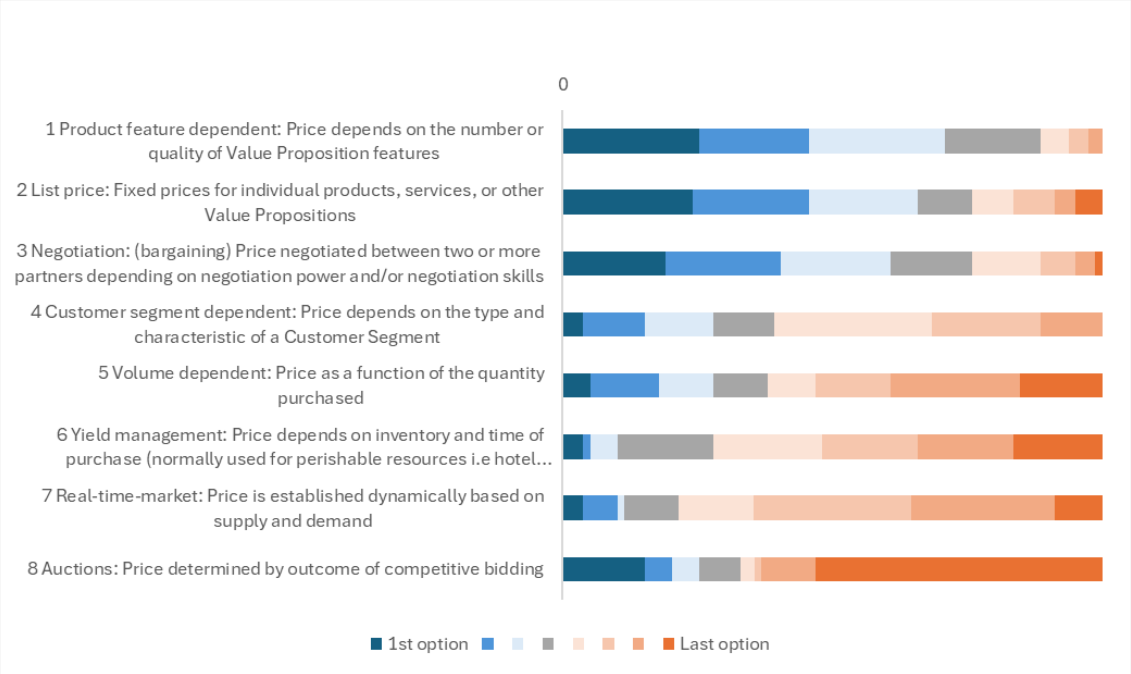
Considering the **Marketing Strategies**, nearly half of the companies in the sample affirm that the most commonly applied strategy is **customization**. This has implications on the importance of personalization in client interactions, the specialized nature of the ecological restoration and the value placed on tailored efforts. Segmented and portfolio strategies are both used by almost one third of the companies (30% and 28%, respectively). These strategies reflect an understanding of the need to address different client groups and product/service lines with a targeted approach. The use of branding strategy by almost 23% of the companies reveals that building a strong brand is important and reinforces the differentiation and client loyalty, even if it is not the primary focus for the majority.

Figure 21. Percentage of response on marketing strategies



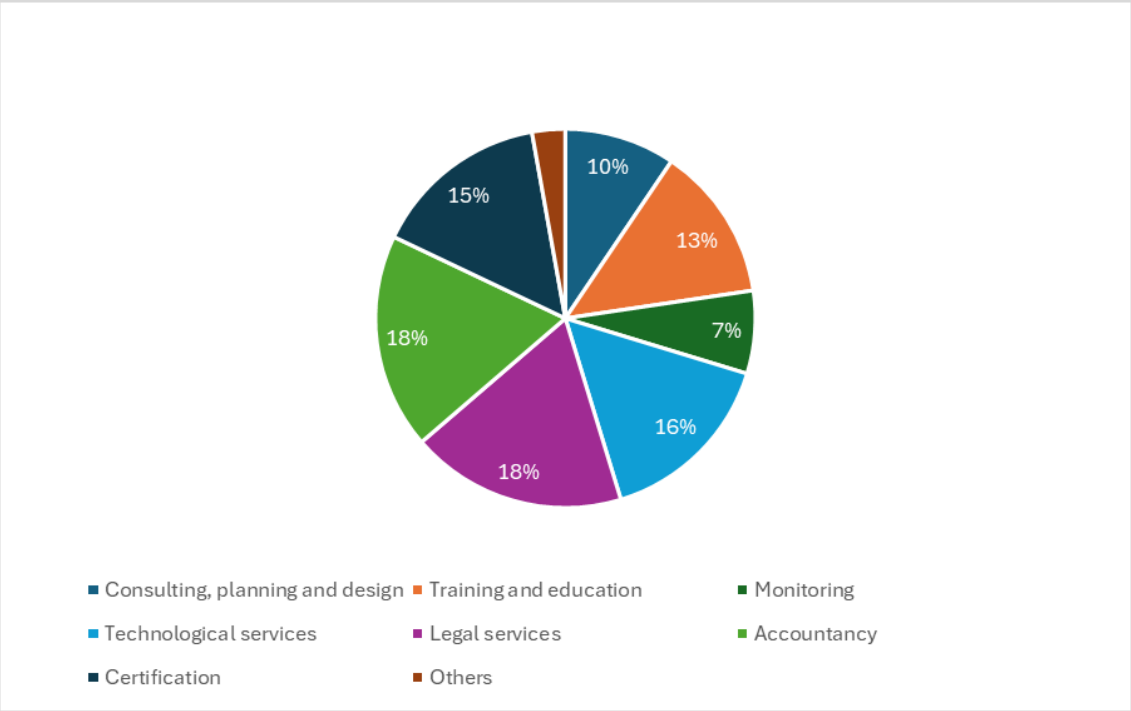
In terms of **Price Strategies**, 25% of the companies prioritize pricing based on the features of their value proposition. This suggests that they may offer tiered pricing based on the quality or quantity of ecological restoration features in their service. A similar proportion of the companies (24%) opt for fixed prices, indicating a straightforward pricing approach with transparent pricing structures. Price negotiation was selected by 19% of the companies, indicating a willingness to adapt pricing based on specific project requirements or client needs. This flexibility in pricing could facilitate partnerships and collaboration. Prices are determined by competitive bidding in only 15% of the companies, in line with the results concerning the Business Model, where B2G scored a critical role in these companies.

Figure 22. Price strategy followed by the respondents



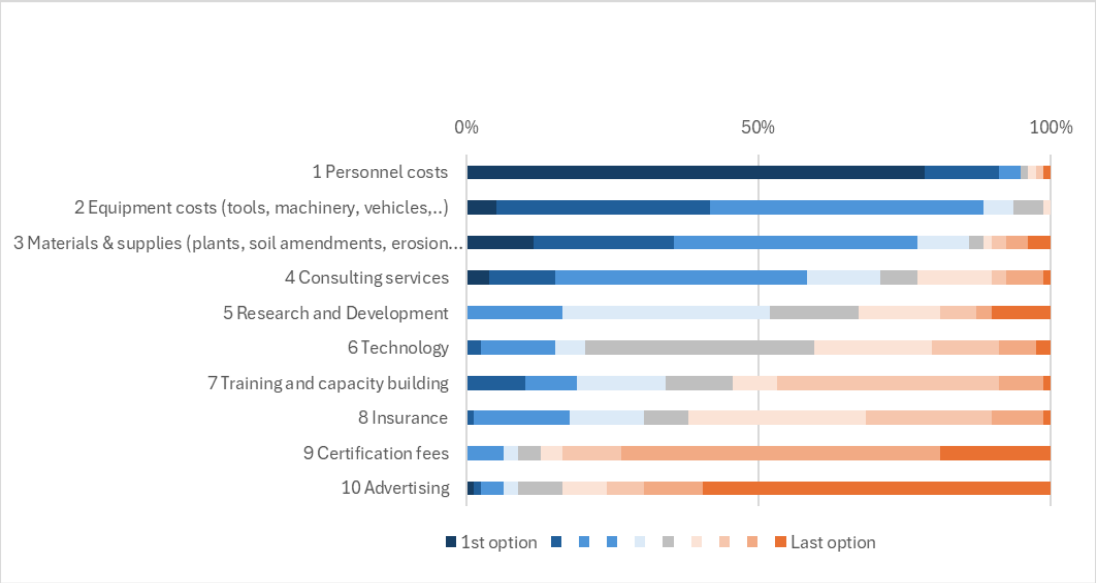
Interdisciplinarity was common in our sample (Fig. 31). Companies collaborate with multiple specialized experts, as no single **external service** plays a predominant role for the respondents. By leveraging a diverse external expertise, ecological restoration businesses can enhance project outcomes, ensure regulatory compliance and promote sustainability in their endeavours.

Figure 23. Percentage of response on the main services that the respondent companies have to contract externally



In terms of **Cost Structure**, companies largely prioritized the investment in skilled personnel (79%; Fig. 31) Other relevant cost elements included Equipment, Materials and Supplies, and Consulting services. For future entrepreneurs, they should try to hire and retain talented individuals with experience in ecological restoration and related fields. Partnering with experienced consultants would also enhance project outcomes and fulfil complex challenges in this sector. The scarce relevance of Research and Development and Technology is remarkable, given the demand for innovation in this sector and the high degree of uncertainty in project outcomes. Uncertainty is not translated into larger costs allocated to Insurance, probably because insurance products specific for ecological restoration projects are in its infancy. Similarly, standards for certification of restoration projects have only been produced in recent years, and they are still far from being popular. Finally, advertising may not be a demand for most companies, whose customers are local and mostly reached by word-of-mouth marketing.

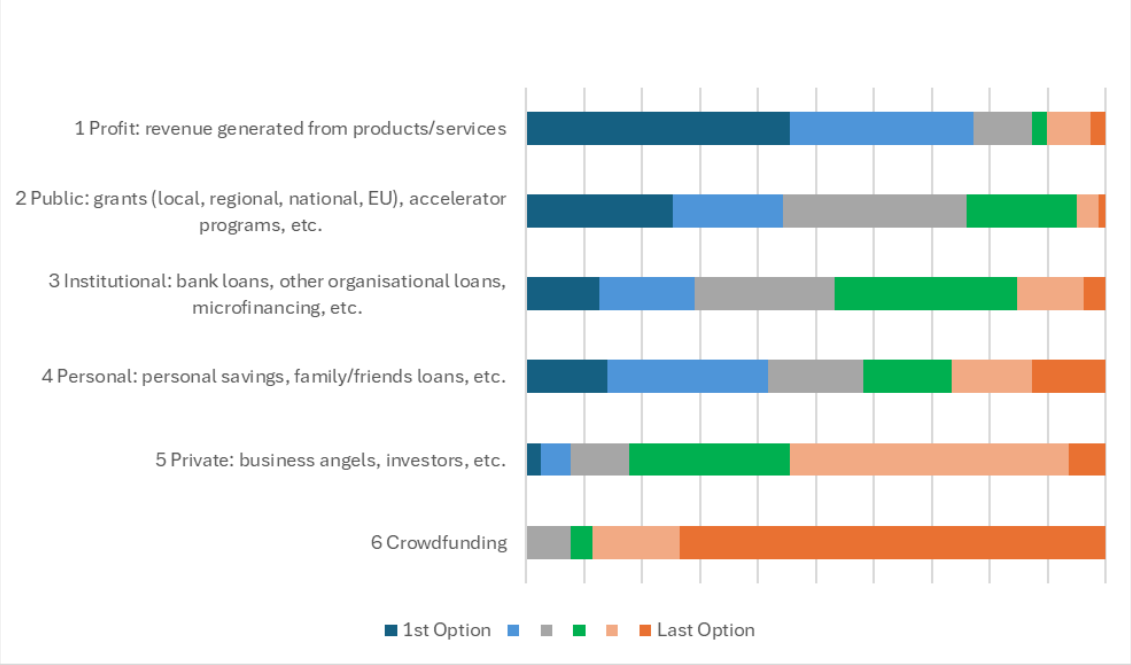
Figure 24. Ranking of cost elements included in the cost structure in order of importance



3.5.- Finance: Sources and Challenges

This section provides an overlook of the financial strategies and preferences expressed by the participating companies (Fig. 33). The most significant **source of funding** for them is the revenue generated from their own products and services. This indicates a strong emphasis on business sustainability and self-reliance through the commercialization of their activity. Public funding through grants and accelerator programs is also relevant. Institutional support is common in the early stages of company development and for large-scale initiatives, as mentioned in previous sections. Traditional funding (bank loans, microfinancing...) is less prioritized, as accessing this type of financing normally implies additional requirements or a strong financial history. Personal funding is also an important source of economic resources, particularly in the early stages. Entrepreneurs often rely on personal savings and loans from "family and friends" which underscores the initial financial challenges faced by new ventures. Crowdfunding is not seen as a suitable option, according to most respondents, possibly due to the specialized nature of the work which might not attract broad-based public investment through crowdfunding platforms.

Figure 25. Main sources of funding of respondent business



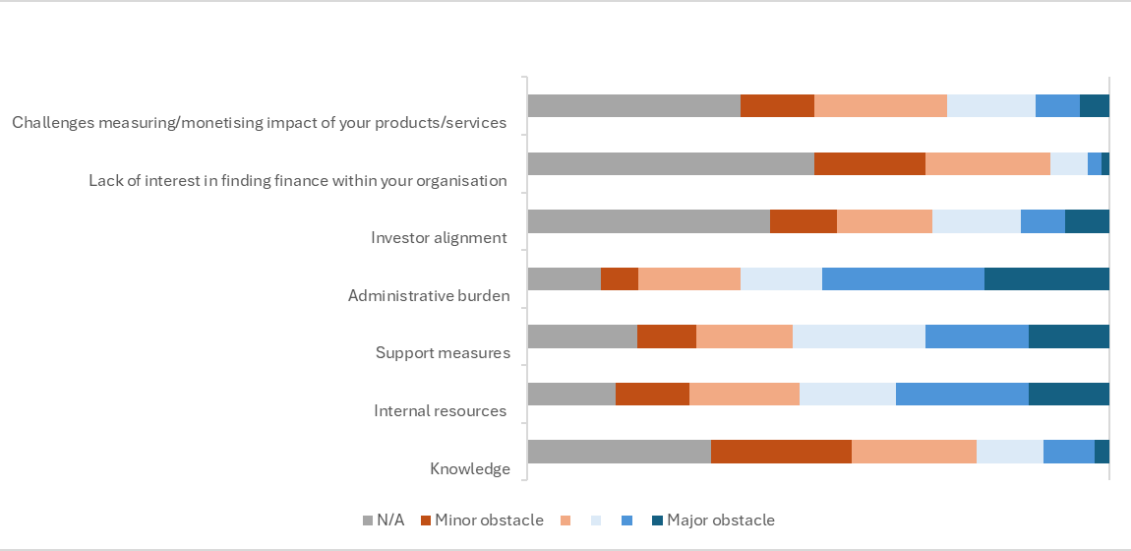
Analysing **financing as a challenge,** the average ranking of 2.9 indicates that financing is perceived as a moderate challenge (Table 26). Responses are distributed across the different business, which means that financing is not considered the single most pressing issue for them. Entrepreneurs should be prepared to navigate financial challenges but can be optimistic. Diversifying funding streams can mitigate the perception of financing as a major challenge.

Table 26. Distribution of responses according to the difficulty of financing the organisation

Challenge of financing the organization	Rate	Answers
The most important challenge we face	5	14
A moderately important challenge	4	15
Somewhere in the middle	3	16
A minor challenge compared with other challenges	2	18
Not a challenge at all	1	16
	n	**79**
Average Ranking	2,91	

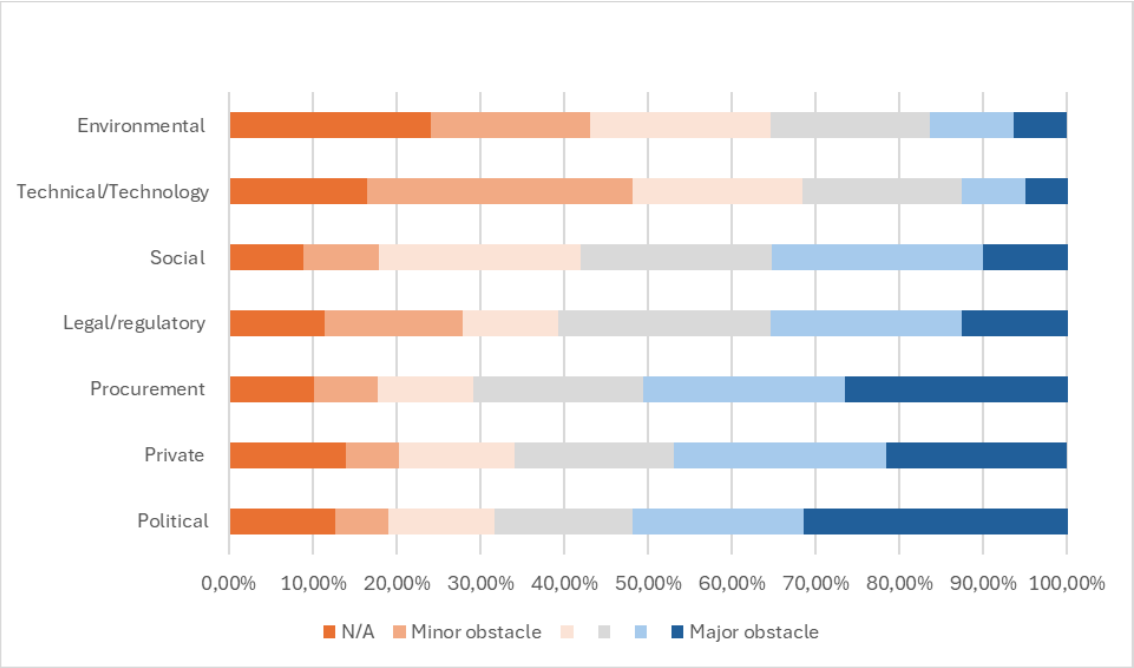
Administrative burden is one of the most critical **barriers to get finance** (Fig. 34). Streamlining administrative processes and reducing bureaucracy can improve access to finance. Companies also stated having enough Internal resources and Support Measures. Mentorship and advisory services can help to overcome these barriers.

Figure 26. Internal barriers to financing



The main **External Barriers to financing** are Political (32%), Procurement (27%) and Private (22%). Addressing them requires collaboration between businesses, government, and other stakeholders to create an enabling environment for financing ecological restoration projects. Regulatory reforms, improved procurement processes and increased social and environmental awareness can help mitigate these barriers and unlock financing opportunities for sustainable restoration initiatives.

Figure 27. External barriers to financing

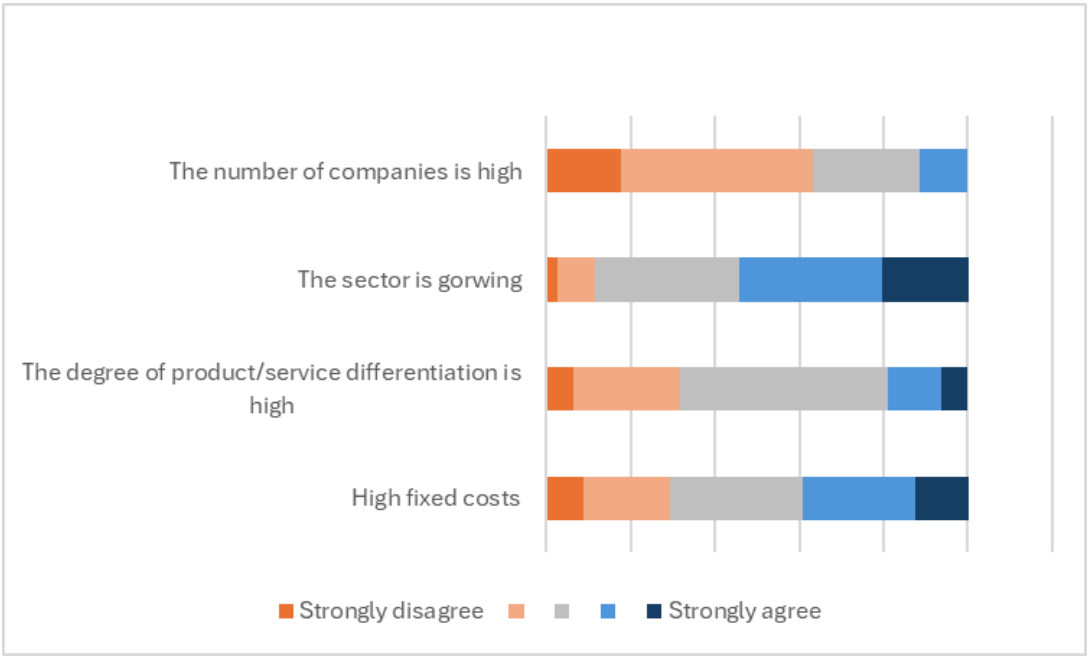


3.6.- Competitive Rivalry

This section shows the main key factors that influence the intensity of competition in the sector, such as the number of companies operating in the market, the industry growth rate, the degree of differentiation in the products or services provided or the fixed costs.

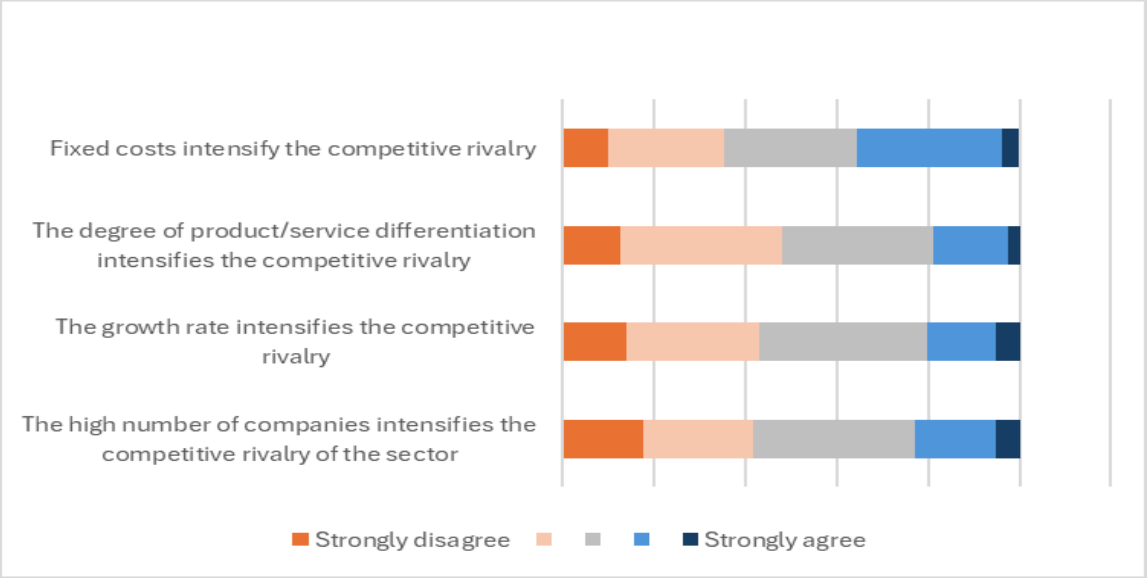
As relates to **Competitive Rivalry** the prevalent perception is that the sector is growing, which represents opportunities for business to capitalize on expansion strategies. There is potential for companies to differentiate their offerings in order to gain a competitive edge. Responses also indicate that the impact of Fixed Costs can represent a challenge for businesses based on their cost structures.

Figure 28. Perception of rivalry in the ecological restoration sector



Of the single factors explaining the **degree of competitive rivalry** Fixed Costs might represent a potential risk to intensify competition (Fig. 37). There is room for increasing companies' activity, considering other factors, as the degree of differentiation and the number of companies operating in the sector, as they are not seen as risk factors, and the company growth rate does not seem to condition the business activity.

Figure 29. Impact on Rivalry in Ecological Restoration sector

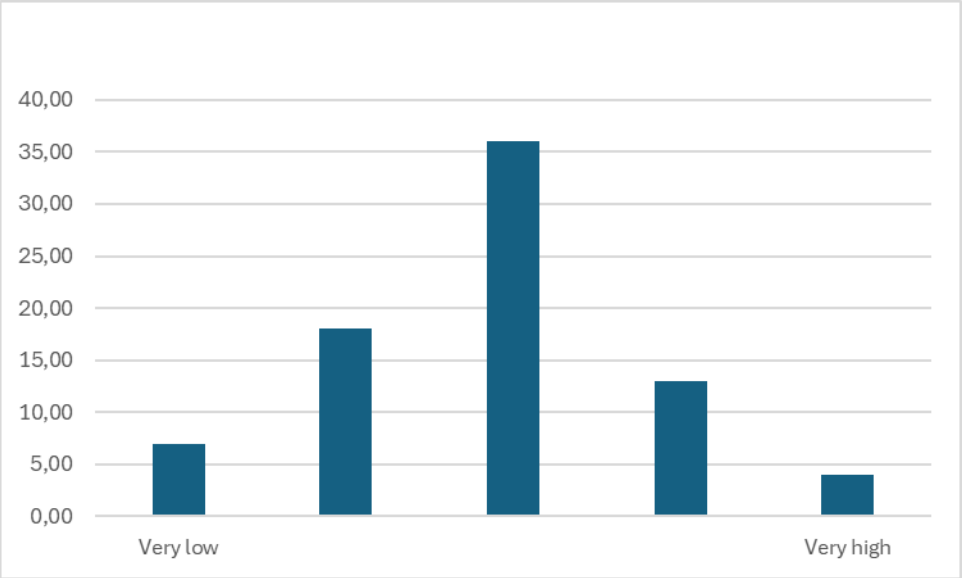


3.7.- Training and Education

This section assesses the current level of training and education among practitioners, identifying skill gaps and understanding the professional development opportunities available. It shows how well-prepared the professionals are to address the complex challenges required when operating in the market.

There is a moderate perception of the current level of the existing **training and educational** level on ecological restoration solutions among practitioners. Respondents consider that there are still opportunities for improvement, particularly in making training more accessible and offering specialized programs to meet the diverse needs they may require.

Figure 30. Current level of training and education on Ecological Restoration Sector



4. Conclusions

The potential for ecological restoration to drive economic growth is substantial. By fostering new economic activities and creating jobs, restoration initiatives can contribute to sustainable development and resilience against environmental challenges. Moreover, the economic benefits of ecological restoration extend beyond job creation, encompassing improved ecosystem services, enhanced biodiversity, and increased resilience to climate change. The political drivers to do restoration are evitable at the international level, as the global assessment reports from IPBES and IPCC strongly support ecosystem restoration as the primary action to reverse landscape degradation and promote the protection of biodiversity. The UN Decade of Ecosystem Restoration and the Kunming-Montreal Global Biodiversity Framework Target #2 underline the overall global need and ambitions for continued success and upscaling of ecological restoration.

Ecological restoration has a positive impact on society, aligning with various Sustainable Development Goals (SDGs) set by the United Nations. These restoration efforts contribute to improved well-being by reducing poverty, promoting healthy living in cities, ensuring clean water access and fostering sustainable livelihoods. They also have impact in generating employment opportunities in conservation, resource management, tourism, and infrastructure, while enhancing urban liveability through green infrastructure that improves air quality and regulates temperature. Additionally, ecological restoration promotes sustainable consumption and production by encouraging waste reduction and resource conservation and sustainable regeneration. Restoration initiatives preserve biodiversity by protecting endangered species, globally important habitats and restoring critical ecological functions in every ecosystem on earth.

The success of ecological restoration projects hinges on the active involvement of diverse stakeholders, including local communities, government agencies, researchers, businesses and NGOs. This inclusive approach ensures that restoration efforts are culturally sensitive as research shows involving local people in the planning and implementation of ecological restoration projects significantly improves results and chances of success. In addition to the impact on biodiversity, safety, and climate mitigation, loss of nature is a severe threat to people's welfare and the global economy. Nature's benefit to people is under pressure, and World Economic Forum has estimated an annual 10% reduction of GNP if degradation of land continues at present rate.

Technological advancements have significantly impacted ecological restoration, enhancing monitoring, planning, and implementation processes through innovations in remote sensing, GIS technology, drones, data analysis, and innovative planting techniques. Remote sensing and GIS technologies,

such as those provided by the Copernicus program and Very High-Resolution satellites, offer high-resolution imagery and detailed 3D analyses, essential for environmental monitoring and disaster management. The integration of these technologies with GIS tools like QGIS allows for precise mapping and assessment of ecological parameters. Drones further enhance restoration effectiveness by providing high-resolution data for vegetation mapping and habitat monitoring, especially in inaccessible areas. Equipped with advanced sensors, drones can facilitate accurate and efficient data collection, supporting informed decision-making and real-time monitoring of restoration progress.

Innovative data analysis and modelling techniques, including Bayesian models and machine learning, offer new insights into ecosystem dynamics and can improve prediction of future outcomes, essential for planning effective restoration interventions. Additionally, hydroseeding with drones has emerged as a promising technology, enabling efficient and precise seed dispersal in challenging terrains. Blockchain technology may enhance traceability and transparency in restoration projects, improving accountability and fostering trust among stakeholders. Digital platforms and networks for collaboration and knowledge sharing in citizen science, such as SpeciesLink and iNaturalist, connect restoration practitioners, facilitating the exchange of best practices and accelerating innovation. These technological advancements collectively improve the efficiency, accuracy, and sustainability of ecological restoration efforts, contributing to the restoration and conservation of degraded ecosystems worldwide.

A significant number of companies have provided information about their activities and business model, which will be very useful for the next phases of the project. There is a wide variety of companies of different sizes, backgrounds, and activities that serve as examples of the business opportunities in ecological restoration.

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6. APPENDIXES

APPENDIX 1: Case Studies and successful examples of business in the field of Ecological Restoration.

CASE STUDIES AND SUCCESSFUL EXAMPLES

Company name:
Agresta S. Coop.

Restoration Typology:
Forests; Education and training;

Founding year:
2000

Number Employees:
Between 10 and 49 employees

Annual Turnover:
Between 1€ million and 5€ million

Location:
Different offices all over Spain

Web page:
www.agresta.org

agresta
Forest solutions for the future

KEYS

Activities

Evaluation and monitoring of forest conditions; Development of customized forest Restoration management plans; Participation in European Projects; Research Projects for improving sustainable practices and processes.

Partnerships

Forestry technology companies; National, regional and local government environmental agencies; Academic institutions for joint research; Network of contacts with forest landowner associations.

Success factors

High level of commitment as most of the workers are company partners; Flexibility to adapt to different situations; Incorporation of INNOVATION into the company's culture; Dedicated to a sector such as environmental, which is increasingly important in our society.

RESOURCES

Knowledge

Experts in forestry and forest management; Environmental monitoring technologies; Database of regulations and certifications; Network of contacts with forest landowners and government entities.

Technology

Remote sensing and LiDAR Data; Application of GIS and GNSS; Development of online map viewers and apps; Satellite data processing; TRL Level: from TRL 3 to TRL 9.

Revenue Streams

Fees for consulting services; Income from environmental certification projects; Charges for training courses and workshops; Participation in research and development projects.

CORE

Mission

We work to improve forestry areas, making use of innovation and putting into practice the values of the cooperative model.

Value Proposition

Sustainable assessment and management of forests; Development of forestry management plan; Environmental certification and sustainability services; Research and development of sustainable forestry practices.

Competitive advantage

Due to our geographical distribution: Local Knowledge; Local Network of Contacts; Quick and Efficient Response. Due to our multidisciplinary team: Wide Range of Services; Comprehensive Approach; Continuous Improvement; Diversity of Tailored Services.

CUSTOMER

Target Customer

Local and national governments with forestry interests; Landowners with forested properties; Other environmental companies.

Customer Relation

Personalized advice on forest management; Support in the environmental certification process; Training and workshops on sustainable practices; Ongoing monitoring of environmental impact.

Channels

Participation in government tenders and projects; Specialized seminars and conferences in the forestry sector.

Positive Impact A company funded by 10 students more than 20 years ago, that keep on developing environmental solutions through a company with values, social economy and cooperative principles.

Drawbacks Some customers do not understand that a company can be a social economy enterprise. In times of economic prosperity and with opportunities in the environmental sector, retaining talent is challenging.

Competitors The competition with large companies and public sector companies is high, and at times, they lower prices to compete.

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CASE STUDIES AND SUCCESSFUL EXAMPLES

Company name:
Medi XXI GSA

Restoration Typology:
Forests; Agricultural land and pasture, including photovoltaic parks; Rivers; Urban spaces; Education and training;

Founding year:
2001

Number Employees:
Between 10 and 49 employees

Annual Turnover:
Between 0.5€ million and 1€ million

Location:
Carcaixent, València (Spain)

Web page:
www.mediXXI.com

KEYS

Activities

Sustainable forest management; Emergencies and civil protection; Environmental and strategic land planning; Environmental education and public participation processes; Ecotourism and sustainable tourism; Digitalisation and technological solutions; Ecological food production and food sovereignty; Renewable energies; Integrated water cycle; Forest Fire Defence System SIDEINFO (own patent).

Partnerships

Private partners and a network of associated companies

Success factors

High capacity for adaptation, diversification and own patent; Capacity for innovation.

RESOURCES

Knowledge

GUARDIAN Project - reclaimed water and green infrastructure (www.proyectoguardian.com); SIDEINFO Project - Forest Fire Defence System (www.sideinfo.org); Own patent (https://patents.google.com/patent/ES2414304A1/es).

Technology

Own risk monitoring platform SIDEINFO NETSense.

Revenue Streams

Engineering services; Training; Maintenance; Forestry works; Applied technology; 65% public client; 35% private client.

CORE

Mission

We are an environmental and agroforestry engineering consultancy providing services to individuals, companies, public administrations, and organisations on a national and international scale with more than 20 years of experience in different types of projects.

Value Proposition

Values are important to us. Engineering is science at the service of society, and humanist values have been with us from the very beginning of our professional activity. Sustainability and professionalism are part of our essence: We approach projects in a transversal, integral and integrated way, providing integral, integrated, sustainable and functional solutions; We design engineering solutions for people, companies, organisations or public administrations following the criteria of sustainable development; We consider people, the environment and the circular economy to meet our needs without harming future generations and the ecosystem that has to sustain them; We have a multidisciplinary team and we involve professionals from different fields, which allows us to have a flexible team to achieve larger projects; We adapt the solutions to the particularities of each project and we respond with honesty, coherence, responsibility and seriousness.

Competitive advantage

Technological innovation: We incorporate disruptive and innovative solutions that enable advances in our workflows; We have several intellectual property registrations and our own patents as a result of our research policy; We are committed to realistic solutions adapted to the availability of resources; We develop digital and technological tools aimed at solving problems in the field of business sustainability, organisations and local development. Commitment: "Ubuntu, I am because we are"; We have a great commitment to our professionals, people and the ecosystem that sustains us; We are committed to putting aside the individualisms of modern society and putting into practice this African philosophy that emphasises values such as empathy, cooperation and the common good; We work with communities, villages, teams... because people together are stronger. We care for and work from the rural world.

CUSTOMER

Target Customer

National and regional public bodies; Non-governmental organisations; Associations; Foundations; Private companies.

Customer Relation

Face-to-face visits; Telephone contact; Social networks.

Channels

Through the contact form on the website; Telephone; Social media; We produce a personalised newsletter; Company blog (https://planetaris.blogspot.com/); Company's YouTube channel with a lot of traffic.

Positive Impact We generate practical projects to promote territorial resources. We generate activity in the primary sector and fire prevention. We restore post-impact floods and fires. In short, we help society to improve its operational response capacity without environmental posturing.

Drawbacks The lack of funding, environmental posturing and the fact that there are companies that embrace "green" not because they believe in the need for this sector but because of purely economic interests.

Competitors There is little competition because of our high degree of specialisation, but the few that do exist usually compete on price, although our policy is not to reduce prices in order to maintain quality. "If it's based on price, it's not our market".

CASE STUDIES AND SUCCESSFUL EXAMPLES

Company name:
BIOCYMA Consultora en Medio Ambiente y Calidad SL

Restoration Typology:
Wetlands; Mining areas; Forests; Education and training:

Founding year:
2007

Number Employees:
Between 10 and 49 employees

Annual Turnover:
Between 0.5€ million and 1€ million

Location:
Murcia (Spain)

Web page:
www.biocyma.com

BIOCYMA
CONSULTORA EN MEDIO AMBIENTE Y CALIDAD

KEYS

Activities

Environmental processing of plans and projects; Environmental studies for industrial activities with an impact on the natural environment; Management and conservation of natural resources; Control of pests and exotic species; Implementation of Environmental Management Systems, Quality Management and Audits; Carbon footprint studies; Mitigation and adaptation to climate change; Specialised environmental training.

Partnerships

Public administrations; Universities and other training centres; Industry, construction companies, engineering companies, etc.

Success factors

Ability to identify new consultancy services needed.

RESOURCES

Knowledge

Knowledge and experience of employees and management.

Technology

Various GIS analyses and modelling; Unmanned flight system; Image processing.

Revenue Streams

Sales of one-off and recurrent services.

CORE

Mission

Comprehensive consultancy specialising in environmental studies and projects, natural environment, and environmental assessment of plans, projects and other types of activities.

Value Proposition

High professionalism of our team and extensive experience

Competitive advantage

Our work as a transmission belt between universities and public administrations

CUSTOMER

Target Customer

Public administrations responsible for or involved in the environment; Engineering firms; Construction companies; Industry; Training centres.

Customer Relation

Mainly via telephone and e-mail.

Channels

With public administrations we are alert to tenders and apply for contracts; With private clients it is they who usually contact us with their needs, although it is true that we already have a large portfolio; When there is a new service, we try to filter the portfolio to identify potential interested parties.

Positive Impact We help developers to visualise the potential for compliance with environmental legislation and benefits for the planet. There are many opportunities to specialise in specific services, and there is not excessive competition.

Drawbacks The intrusion of professionals from other sectors such as engineers, lawyers, etc. Sometimes our company is seen as a mere formality.

Competitors Amable, there is so much specialisation that there are few specific areas of service in which we overlap, and there is usually collaboration between companies that are a priori competitors.

CASE STUDIES AND SUCCESSFUL EXAMPLES

Company name:
Regiosaatgut Murrmann

Restoration Typology:
Agricultural land and pasture, including photovoltaic parks; Linear infrastructures (railways, roads, power lines);

Founding year:
2022

Number Employees:
Less than 10 employees

Annual Turnover:
Less than 0.5€ million

Location:
Weismain (Germany)

Web page:
www.saatgut-murrmann.de

Regiosaatgut Murrmann

KEYS

Activities

Donor area management; Harvest management; Administration

Partnerships

Nature conservation authorities and other public bodies; Photovoltaic companies; Private buyers.

Success factors

Regionality; Technology; Teamwork.

RESOURCES

Knowledge

Theoretical and practical experiences/training (agriculture and nature conservation)

Technology

Not relevant to our organisation.

Revenue Streams

Sales of regional seeds.

CORE

Mission

Our mission is to obtain regional meadow seeds and to market them as locally as possible in order to preserve biodiversity.

Value Proposition

Regionality

Competitive advantage

Threshing material from the region, which can be offered region-specifically

CUSTOMER

Target Customer

Public providers; Providers of environmental compensation measures.

Customer Relation

By phone or online via email.

Channels

By phone or online via email.

Positive Impact The possibilities for preserving biodiversity are high. Without suitable regional seeds, we are rapidly losing more species without noticing it or knowing the causes.

Drawbacks Our biggest threat are the legal changes at European level. On the other hand, the land consumption is constantly reducing nature conservation areas, so that at some point probably no new areas can be created

Competitors A few large providers who (want to) cover as much as possible.

CASE STUDIES AND SUCCESSFUL EXAMPLES

Company name:
Primigenius Köthener Naturschutz und Landschaftspflege gGmbH

Restoration Typology:
Agricultural land and pasture, including photovoltaic parks; Wetlands;

Founding year:
2022

Number Employees:
Less than 10 employees

Annual Turnover:
Less than 0.5€ million

Location:
Osternienburger Land (Germany)

Web page:
www.primigenius.de

PRIMIGENIUS

KEYS

Activities

Improving site conditions that are important for biological diversity; The animals' feeding activity counteracts the domination of grasses and bush encroachment and promotes the vegetation structure of the pasture area; Grazing benefits for plants, insects and insectivorous birds; Increasing in diversity.

Partnerships

The Anhalt and Eberswalde universities; Various authorities; The Middle Elbe Biosphere Reserve; The Middle Elbe Federal Forestry Commission; Local schools; Private companies; Farms; Church groups.

Success factors

We are not profit-oriented, which means we are consistent in the implementation of our goals; We add recreational value to the landscape (by means of guided tours, excursions and educational offers); The results of our researchs on our working areas enhance the reputation within them.

RESOURCES

Knowledge

We do not have any trademark rights or patents; Our employees have specialist training; We regularly have interns and students in our company to whom we explain our work.

Technology

We have developed strategies to convert previously ungrazed areas into a different usage regime. This includes the development of a multi-year usage concept in the sense of a nature development plan in consultation with the responsible authorities and the land owner; Knowledge of the specific requirements that living beings place on their habitat; During grazing, animal numbers and species ratios are determined and the necessary infrastructure is set up.

Revenue Streams

The funds from agricultural subsidies are predominant; Income from meat marketing and live cattle sales are secondary; We offer free guided tours.

CORE

Mission

Our aim is to carry out nature and landscape conservation projects in Wulfener Bruch and other areas in central Germany. With the help of large grazing animals, such as Heck cattle and robust horses (Koniks), Primigenius carries out extensive grazing throughout the year, thus securing habitats for endangered animal and plant species. We also create small wetlands for amphibians, offer piles of dead wood as hiding places for reptiles and small mammals, and maintain pollarded willows. We currently manage 145 hectares of grassland in Wulfen and 800 hectares of heathland on a former military training area in Oranienbaum.

Value Proposition

We carry out nature and landscape conservation projects; Extensive grazing to improve the habitat of endangered animal and plant species; Our animals feed on natural pastures all year round; With our offer we also make the region and the pastoral projects known; We produce meat in a particularly environmentally friendly and resource-saving way; Animals are only slaughtered when necessary and on a small scale; Top quality meat products and scarce meat products are highly appreciated by consumers who know our land and our pastures; Our product is the "blooming landscape", the sale of meat is in the background.

Competitive advantage

Improving site conditions that are important for biological diversity. In comparison to, for example, organic suckler cow farmers, our goal is not to produce cattle, but rather to maintain the landscape with grazing animals. Other horse-keeping businesses offer residential animal husbandry or riding. This is not the case with us. Our animals live all year round in a semi-wild outdoor environment, receive no additional feed or medication and only have the task of grazing.

CUSTOMER

Target Customer

Customers in the sense of buyers of our products are local end users; Customers in the sense of those interested in nature and environmental protection come from the local area, but also from abroad through institutions such as the Anhalt University of Applied Sciences, the NABU or the biosphere reserve, sometimes also from abroad; Other conservation organization.

Customer Relation

Meat customers receive advertising flyers for our events; We are reliable and therefore have long-term customers.

Channels

Presentation of company services on excursions and events; Internet presence and a functioning online shop.

Positive Impact Participation in our events offers insights into the development of a landscape under the influence of grazing animals, the specific demands of plants, insects and animals on their habitat and shows ecological connections between land use and biodiversity.

Drawbacks In our work, we rely on landowners to make land available to us and not to use it as agricultural or forestry land. Since funding is our main source of income, funding for nature conservation projects is essential. Current EU agricultural funding focuses on grassland. We benefit from this. If the member states set different priorities, this would be disadvantageous for us.

Competitors When it comes to meat marketing, we compete with other animal farmers and marketers. However, our share of the market is very small and we offer products with specific characteristics, namely meat from organic, local, year-round pasture farming. The breed of animals kept is also a unique feature in our region. In terms of excursion destinations and educational offerings, we compete with local recreation areas and other highly attractive landscapes. These usually offer better accessibility and more infrastructure. Our areas often contain explosive ordnance-contaminated zones or access-restricted areas that limit the range of movement for visitors.

CASE STUDIES AND SUCCESSFUL EXAMPLES

Company name:
Norwegian Institute for Nature Research - NINA

Restoration Typology:
Forests; Rivers; Linear infrastructures (railways, roads, power lines); Wetlands; Mining areas; Education and training; Urban spaces;

Founding year:
1988

Number Employees:
More than 250 employees

Annual Turnover:
More than 50 € million

Location:
Trondheim (Norway)

Web page:
https://www.nina.no/english/Home

NINA
Norwegian Institute for Nature Research

KEYS

Activities

Research and assessment, environmental monitoring, advisory services and evaluation in the following research areas: Freshwater ecology, Salmonids, Coastal ecology and seabirds, Renewable energy, Terrestrial ecology, Pollination and entomology, Deer and reindeer, Carnivores and society, Nature restoration and nature-based solutions, Urban ecology and natural capital, Ecological condition and nature indexes, Method development, mapping, and big data, Social research; Active dialogue and communication with the wide spectrum of societal actors are prerequisites for our work.

Partnerships

The Norwegian Ministry of the Environment; Other Norwegian public authorities, industry and private businesses; The Norwegian Research Council; International funding organisations, such as EU.

Success factors

High level of commitment and intrinsic motivation to work for the benefits of the environment and society; High recognition of the professional expertise of our employees; Wide spectrum of fields of expertise; Extant network of contacts to societal actors and stakeholders on the local, regional, national and European level; Low degree of bureaucracy in our administration; Flat organisational hierarchy; Flexibility to adapt to different situations and contexts; Very good team work and team spirit; Very attractive employer for many young researchers.

RESOURCES

Knowledge

Up-to-date scientific knowledge of the NINA researchers; Long-standing experience in applied environmental research and practical projects; Large databases and datasets for single species, ecosystems and monitoring; Environmental monitoring technologies; GIS-based models; Extensive network of project partners and extensive network of contacts with a wide spectrum of societal actors, incl. companies and public authorities, on the local, regional and national scales.

Technology

Geographic Information Systems (GIS); Environmental observation and monitoring tools; Remote Sensing technology; DNS Analysis and Molecular Techniques; Laboratory technology; Statistical Modelling and Data Analysis technology; Public survey technology; Collaborative Research Networks.

Revenue Streams

Public grants and founding from Norwegian public bodies; Industry and private businesses founds; International/European funds, e.g. European Union.

CORE

Mission

NINA is an independent foundation whose mission is to conduct socially relevant research on nature and its interaction with society.

Value Proposition

We offer cooperation and expertise for a sustainable future; We contribute to the sustainable development of society by providing relevant research-based knowledge on biodiversity, climate and society; We conduct socially relevant nature research; We provide knowledge for use in policy, management and value creation, contributing to sustainable decision-making in society; Our work includes both research and assessment, environmental monitoring, advisory services and evaluation.

Competitive advantage

Scientific expertise; Long-standing experience; NINA is present in the largest university cities in Norway which contributes to strong research collaborations with universities and strengthens the possibility of recruiting excellent researchers; NINA has project collaborations with research institutions in more than 30 countries in Europe, Africa, Asia, and America.

CUSTOMER

Target Customer

The Norwegian Ministry of the Environment; Other Norwegian public authorities; Industry and private businesses; The Norwegian Research Council; International/European funds, e.g. European Union.

Customer Relation

Research collaboration with government agencies, NGOs, industry partners, and other research institutions to conduct research projects and address environmental challenges; We provide consultation and advisory services to government agencies, policymakers, businesses, and other organizations seeking expertise on environmental issues; We offer capacity-building workshops, training programs, and educational resources to empower stakeholders to better understand and address environmental issues; We engage with the general public through outreach events, educational programs, and media outreach; We actively seek feedback from stakeholders to improve its research priorities, methodologies and communication strategies.

Channels

Research collaborations involve sharing expertise, data and resources to achieve common goals; We provide consultation and advisory services by scientific assessments, policy recommendations and technical assistance; We disseminate research findings, reports, and data through various channels, including our website, social media, publications, conferences, workshops, and online platforms; Quality securing system that requires active feedback from the customers; We organize outreach events, education programmes and media dissemination; We work collaboratively to enerate knowledge, provide expertise, and promote sustainable solutions for the benefit of both society and the environment.

Positive Impact Contributing to improve and promote biodiversity conservation, environmental policy and management, nature restoration, climate change adaptation, public awareness and education, scientific research and innovation. It helps to highlight the value of nature and the benefits it provides to society (ecosystem services). All of this is contributing to the sustainable management of natural resources and the protection of ecosystems for future generations.

Drawbacks NINA has been growing rapidly in the last years due to a good market situation and optimism in the future opportunities . This might pose a potential threat if the funding possibilities migth become less, e.g. due to political changes.

Competitors It can be large in the context of several extra-universital research institutes in Norway active in the environmental field. There is also competition for funds with the universities that largely do not need to (totally) account for the person costs for their researchers to conduct projects.

CASE STUDIES AND SUCCESSFUL EXAMPLES

Company name:
Hæhre Entreprenør AS

Restoration Typology:
Linear infrastructures (railways, roads, power lines); Mining areas; Agricultural land and pasture, including photovoltaic parks; Rivers;

Founding year:
1974

Number Employees:
More than 250 employees

Annual Turnover:
Between 10 € million and 50 € million

Location:
Billingstad, Asker (Norway)

Web page:
www.skh.no

KEYS

Activities
Project planning and execution.

Partnerships
Builders; Subcontractors; Suppliers.

Success factors
Own workforce; Robust organization; Cooperation with the client; Adaptability in line with the client's requirements and expectations.

RESOURCES

Knowledge
Professional expertise in infrastructure; Project management; ISO 14001, ISO 37001, ISO 45001, ISO 9001 and ISO 39001; Support functions, such as planning, engineering, HSE, environment.

Technology
We are investing in digitalisation and have a common corporate strategy for digitalisation.

Revenue Streams
Our income is based on carrying out projects for our clients.

CORE

Mission
We build infrastructure for public and private developers.

Value Proposition
"We build the future" (in Norwegian Vi bygger fremtiden). The goal is to carry out projects with the right quality, safety and with the least possible damage to the environment.

Competitive advantage
We compete on climate and environmental requirement in tender process. The competitive advantage lies in optimizations and good profitable and sustainable solutions.

CUSTOMER

Target Customer
Public and private clients.

Customer Relation
High focus on meeting the client's requirements and expectations; Good planning, cooperation with the client and build projects in line with the contract.

Channels
Public procurement through tender processes; In the project, we communicate through meetings.

Positive Impact
The development of projects with a focus on sustainability is part of our corporate social responsibility as an entrepreneur. We build infrastructure that creates value for society. We create positive impacts through a high job security, high focus on health and security, a high degree of unionisation, competence, training etc. A good and inclusive working environment creates engaged employees who contribute to increased productivity and quality. We see opportunities in innovation, increased requirements for climate and the environment from the client, as well as legal requirements related to ESG, integrations in the value chain to create increased value for the client. Opportunities through projects within nature restoration, power development, etc..

Drawbacks
Limited access and higher costs of materials, equipment and processes due to climate change, CO2 taxes, higher energy prices etc.. Risk related to human rights in the value chain. Different public procurement practices. Fines related to non-compliance with requirements. Our industry has a high risk of HSE and has a negative impact on the climate and the environment due to our activities and machinery in infrastructure project. We are certified according to several ISO standards to ensure a systematic approach to HSE, environment etc.

Competitors
Public and private tender processes. In addition to competing on price, we compete on solutions, organization, quality, HSE, etc. The environment and climate are emphasized by 30% in public procurements.

CASE STUDIES AND SUCCESSFUL EXAMPLES

Company name:
ADAPTO.space

Restoration Typology:
Agricultural land and pasture, including photovoltaic parks; Wetlands; Education and training;

Founding year:
2022

Number Employees:
Between 10 and 49 employees

Annual Turnover:
Less than 0.5€ million

Location:
Hodkovičky, Prague (Czech Republic)

Web page:
www.adapto.space

ADAPTO.space
Vracíme udržitelný život krajině

KEYS

Activities
Project documentation; Implementation activities.

Partnerships
Private farmers and agricultural cooperatives; Municipal and city leaders and other institutions (e.g. regional authorities), local action groups; AQUAINOVA; Mokřady, z.s.

Success factors
Innovation in the field of nature and landscape conservation; Own know-how; Cooperation within a multidisciplinary team; Networking and cooperation with other companies; Platforms and institutions (e.g. research).

RESOURCES

Knowledge
Employee experience; Own know-how.

Technology
Design office (PC hardware and software); Technology park (excavators and other equipment); Part of the Yottabe Group (HR, accounting, marketing).

Revenue Streams
Project and implementation activities.

CORE

Mission
Our mission is the revitalisation of the landscape and the restoration of the hydrological regime of the landscape, from landscape assessment through project activities to implementation activities.

Value Proposition
*Design of measures: Project documentation; Administration of subsidies; Engineering; Implementation activities. *-Creation of pools and wetlands: improvement of land reclamation; Restoration of ponds; Construction of natural ponds; Revitalisation of watercourses; Planting of vegetation elements; Agricultural and legal advice; Awareness-raising and education.

Competitive advantage
A team of experts from different sectors; Follow-up phases of the project (measure design, project documentation, engineering, grant administration, implementation); Cooperation with other organisations and companies: -Innovation

CUSTOMER

Target Customer
Municipal and town leadership; Agricultural cooperatives; Private farmers.

Customer Relation
Often long-term, based on consultation and discussion in the form of advice (in the case of an agricultural cooperative).

Channels
Website; Social networks; Company presentation at trade fairs and local events.

Positive Impact Adaptation of the landscape to climate change, revitalization of the landscape water regime and water retention in the landscape. We also employ people who see nature and landscape conservation as their mission (previously they often did this mainly on a voluntary basis).

Drawbacks We have found no threats so far.

Competitors For us, competition is not high.

APPENDIX 2: Case Studies Template

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(1) GENERAL DESCRIPTION

Company name:
Web page:

Restoration Typology:

- Agriculture
- Infrastructure & landscape
- Urban & Rural landscape
- Forest & other
- Other sectors: (Tourism, Art,…)

Founding year:
No. Employees:
Annual turnover:
Location:

(3) KEYS

ACTIVITIES

(3a)

PARTNERSHIPS

(3.b)

SUCCESS FACTORS

(3.c)

(4) RESOURCES

KNOWLEDGE

(4.a)

TECHNOLOGY

(4.b)

TRL level:

REVENUE STREAMS

(4.c)

(2) CORE

MISSION

(2.a)

VALUE PROPOSITION

(2.b)

COMPETITIVE ADVANTAGE

(2.c)

(5)CUSTOMER

TARGET CUSTOMER

(5.a)

CUSTOMER RELATION

(5.b)

CHANNELS

(5.c)

Positive Impact & Opportunities

Drawbacks & Threats

Competition

GUIDELINES ON HOW TO FILL IN THE CANVAS

Co-funded by the European Union

1) **GENERAL DESCRIPTION** of the company.

1) **CORE**

a) MISSION: It provides information about the **purpose** of the company creation. It explains the products and services the company offers and its target client.

b) VALUE PROPOSITION (VP): It is the **reason** why your clients are **willing to pay** for your products and services. In the case of ER companies, the VP also includes the economic, social and environmental impact.

c) COMPETITIVE ADVANTAGE: Attribute that makes the company perform better or marks the difference with respect to the rest of the companies in the sector. It is the factor by which companies and clients **identify** you in the market.

1) **KEYS**

a) ACTIVITIES: Activities that the business must perform **to deliver its value proposition** and operate successfully (the most important things a company must do to make the business model work)

b) PARTNERSHIPS: The relationships and collaborations that the business has with its suppliers, vendors, and other **external partners**. (Network of suppliers and strategic partners that make the business model work)

c) SUCCESS FACTORS: It has to do with the strategy, communication, skills (HR), technology, processes/operations, management, teamwork, value or other characteristic that is essential to perform and consolidate the business in the market.

1) **RESOURCES**

a) KNOWLEDGE: Employees know-how and experience, patents, trademarks, copyrights,...

b) TECHNOLOGY: Technological capabilities required to deliver the value proposition

c) REVENUE STREAMS: The different sources of revenue that the business generates from its customers, including one-time sales, recurring revenue, subscription and other revenue streams.

1) **CUSTOMER**

a) TARGET CUSTOMER: It describes the different type of client **profile** your business is focus to.

b) CUSTOMER RELATION: It shows how the company is dealing with clients.

c) CHANNELS: It explains how the company communicates with and reaches customer segments to deliver the value proposition

APPENDIX 3: Questionnaire

This questionnaire is aimed at capturing a wide range of insights from professionals, companies and further stakeholders involved in the sector. The survey is structured in six sections, each section focusing on a different aspect of the ecological restoration.

Section 1 focuses on the Company Profile. This section seeks to gather fundamental information about the organisations in the E.R, including its size, structure, geographical reach and areas of specialization. Understanding the diversity and the scope of the organisations involved in this field will provide a first approach to the type of organisations working in the E.R sector.

Section 2 is about the Market Structure and Trends. This section explores the dynamics of the market with the objective to find out the opportunities and challenges faced by businesses in the E.R sector. Insights onto market structure and trends will help in understanding how the industry is evolving and what the future developments might be expected.

Section 3 examines the Business Models based on the contributions of the Business Model Canvas[25] framework proposed by Alexander Osterwalder. This part will investigate how companies in the E.R create, deliver and capture value.

Section 4 addresses to gather information on the funding resources and economic challenges faced by companies. Understanding the financial landscape will shed light on the financial aspects that businesses involved in the E.R have to face and the type of resources they apply in their activity.

Section 5 analyses the Business Environment. This section is based on the Porter´s[26] forces framework. This section evaluates the competitive forces that shape the E.R sector specially the threat of new entrants and the intensity of the competitive rivalry. By assessing these forces, it will be possible to identify the key factors that influence the competitive dynamics and strategic decisions.

Finally, Section 6 explores Education, Knowledge and Skills Development seeking to understand the educational background, training needs and skills development opportunities for professionals. Insights from this section will help identify gaps in education and suggest areas for improvement to support professional growth and advancement.

[25] https://vace.uky.edu/sites/vace/files/downloads/9_business_model_generation.pdf
[26] https://assets.website-files.com/6083190ced6a3f3a0bb1cff2/60b536e9575668cd342d517d_Porters%205%20Forces.pdf

1. Please, **select your country**: Czech Republic, Germany, Norway, Spain
Section 1: Company Profile
2. What is the **legal form** of your enterprise?
Individual entrepreneur
Private company (Limited Liability Company/ Public Limited Company)
Cooperative Society
NGO´s (Nonprofit organisations)
Association
Other, please specify
3. What is the **stage of growth** of your business?
Startup
Take-off Growth
Resource Matutiry
Decline
4. **Number of employees**
Less than 10 employees
Between 10 and 49 employees
Between 50 – 250 employees
More than 250 employees
5. Last **annual turnover**
Less than 0.5€ million
Between 0.5€ million and 1€ million
Between 1€ million and 2€ million
Between 2 € million and 10 € million
Between 10 € million and 50 € million
More than 50 € million
6. **What percentage of your turnover does ecological restoration represent?**
Less than 25% of the total
Between 25% and 50% of the total
Between 50% and 75% of the total
Between 75 and 100% of the total
7. **Main Business Goal** Maximum 2 options to choose from
Economic profit
Social goals
Environmental goal
Both profit and non-profit goals
8. **Main market** of your activity Maximum 3 options to choose from
Local
Regional
National
European

International
9. **Main** services provided Maximum 3 options to choose from
Consulting, planning and design
Training and education
Onsite restoration
Monitoring
Restoration supplies (i.e.., planting pots, nursery plants, seeds, compost, mulches, etc.)
Legal services
Certification
Section 2: Market structure and trends
10. What is your **main** market sector?
Biodiversity Conservation
Carbon offsetting and trading
Ecological restoration services: Agroecosystems
Ecological restoration services:Infrastructures (roads, railways, power lines)
Ecological restoration services:Mining
Ecological restoration services:Peatlands
Ecological restoration services:Rivers
Ecological restoration services:Urban and periurban seettings
Ecological restoration services:Wetlands
Ecological restoration services:Woodlands (including forests, shrublands, steppes, grasslands)
Environmental Education and Outreach
Green Building and Construction
Renewable energy production
Sustainable forestry
Water Resource Management
Other, please specify
11. What **other sectors** are you involved in? Maximum 3 options to choose from
Biodiversity Conservation
Carbon offsetting and trading
Ecological restoration services: Agroecosystems
Ecological restoration services:Infrastructures (roads, railways, power lines)
Ecological restoration services:Mining
Ecological restoration services:Peatlands
Ecological restoration services:Rivers
Ecological restoration services:Urban and periurban seettings
Ecological restoration services:Wetlands
Ecological restoration services:Woodlands (including forests, shrublands, steppes, grasslands)
Environmental Education and Outreach
Green Building and Construction
Renewable energy production
Sustainable forestry

Water Resource Management
Other, please specify
12. **Number of years** of activity
Less than 3 years
Between 3 and 10 years
More than 10 years
13. How would you rate the **market demand** in the Ecological Restoration? Mark from 1 to 5, with 1 being a strong decrease and 5 being a strong increase.
14. How would you rate your **business demand?** Mark from 1 to 5, with 1 being a strong decrease and 5 being a strong increase.
15. Which **networks** do you regularly use to keep informed about current and emerging trends in your sector(s)? 1 being the least important and 5 the most important. For networks that you do not use at all, mark N/A (Not Applicable).
Government publications and laws
Scientific publications
Technical reports and manuals
Professional and scientific conferences, webinars and/or websites
E-distribution list
Courses
Peer-to-peer communication
16. Through which **other channels** do you keep informed about current and emerging trends in your sector(s)? Optional
17. What are the **main opportunities you see for your products/services** in the upcoming years? Maximum 2 options to choose from
Emerging technologies
New methodologies
Shifts in stakeholder priorities
18. In your opinion, **what factors are driving the demand for ecological restoration services** in the market? Optional
Section 3: Business model and Revenue streams
19. Who are the **most important** customers you address? Maximum 2 options to choose from
B2B (Business to Business): Company that markets to other companies
B2C (Business to Consumer): Company that sales to the final consumer
B2B2C (Business to Business to Consumer): Company that sells to the final consumer through an intermediary company
B2G (Business to Government): Company that sells to government
P2P (Peer to peer) or C2C (Consumer to consumer): Company designed to facilitate a transaction between 2 individual users. Usually in a marketplace model
20. What is your **main value proposition**? Rank the options from highest (1) to lowest (9) according to the value you think your company offers to its customers. Use the arrows to order the options.
Price
Innovation

Higher level of quality than competitors
Timeliness
Superior performance to competitors' products
Minimising the risks
Minimising Cost / Cost reduction
Design
Customisation-products/services adapted to customer needs
21. What **channels of distribution** do you use with your clients? Several responses
Own direct channels
Own online channels
Indirect channels
22. Could you please specify which indirect channels you use? Optional
23. What is your **main customer relatinonship?** Maximum 2 options to choose from
Personal assistance
Creating communities
Co-creation
24. What are your **main revenue streams**? Rate from 1 to 5, where 1 is not important at all and 5 is very important.
Product sale
Services sale
Usage fee
Subscription fees
Lending/Renting/Leasing
Licensing
Brokerage fees
Advertising
25. What is your **marketing strategy**? Maximum 2 options to choose from
Mass marketing
Segmented strategy (depending on the different groups of client profile)
Customized strategy (1 to 1)
Branding strategy
Portfolio strategy (depending on the different groups of the company products/services)
26. What is your **price strategy**? Please order from 1 to 8, with 1 being the main option in your pricing strategy and 8 being the least or not at all used. Use the arrows to organise your answers.
List price: Fixed prices for individual products, services, or other Value Propositions
Negotiation: (bargaining) Price negotiated between two or more partners depending on negotiation power and/or negotiation skills
Product feature dependent: Price depends on the number or quality of Value Proposition features
Yield management: Price depends on inventory and time of purchase (normally used for perishable resources i.e hotel rooms or airline seats)
Customer segment dependent: Price depends on the type and characteristic of a Customer Segment
Real-time-market: Price is established dynamically based on supply and demand

Volume dependent: Price as a function of the quantity purchased
Auctions: Price determined by outcome of competitive bidding
27. What are the **main services you must acquire externally**? Maximum 4 options to choose from
Consulting, planning and design
Training and education
Monitoring
Technological services
Legal services
Accountancy
Certification
Other, please specify
28. Please **rank** the **cost elements included in your cost structure** in order of importance. 1 being the most important and 9 being the least important. Use the arrows to organise your answers.
Personnel costs
Materials & supplies (plants, soil amendments, erosion control materials)
Equipment costs (tools, machinery, vehicles...)
Consulting services
Research and Development
Technology
Insurance
Training and capacity building
Certification fees
Advertising
Section 4: Sources of Funding and Financial resources
29. What are your **main sources of funding**? Please rank in order from most to least important, with option 1 being the main source of funding and option 6 being the least important. Use the arrows to organise your answers.
Personal: personal savings, family/friend's loans, etc.
Public: grants (local, regional, national, EU), accelerator programs, etc.
Institutional: bank loans, other organisational loans, microfinancing, etc.
Private: business angels, investors, etc.
Profit: revenue generated from products/services
Crowdfunding
30. How **much of a challenge is financing** for your organisation? Please mark from 1 to 5 with 1 being no challenge at all and 5 being the most important challenge we face.
The most important challenge we face
A moderately important challenge
Somewhere in the middle
A minor challenge compared with other challenges
Not a challenge at all
31. What challenges other than financing does your company face? Optional

32. Rank these **barriers to financing** within your organisation. 1 being the lowest barrier and 5 being the highest barrier. Mark N/A if the option is not an obstacle to funding.
Knowledge i.e. lack of knowledge on different financing options
Internal resources i.e lack of time or capacity within your organisation to explore financing options
Support measures i.e. existing public sector grants/supports aren't suitable for you (and how you are set-up)
Administrative burden, i.e. when applying for public grants
Investor alignment i.e. disparity between your (the company) needs and private investor's needs (return on investment etc.)
Lack of interest in finding finance within your organisation
Challenges measuring/monetising impact of your products/services
33. Rank these **barriers to financing** external to your organisation. 1 being the lowest barrier and 5 being the highest barrier. Mark N/A if the option is not an obstacle to funding.
Political i.e. lack of prioritisation for public investment in ecological restoration
Private i.e. lack of prioritisation for private investment in ecological restoration
Procurement i.e. lack prioritisation of nature and diversity in public and private tenders
Legal/regulatory i.e. lack of regulation in support of ecological restoration
Social i.e. lack of public awareness/support
Technical/Technology i.e. technical/technology gaps or challenges with ecological restoration solutions
Environmental i.e. impact of climate change and biodiversity loss on your organisation
Section 5: Business environment. Barriers and Competitive rivalry
34. In your opinion, what are the **main barriers of entering** in the ecological restoration business activity? Maximum 4 options to choose from
Technical Expertise (specialized knowledge)
Environmental regulations
Access to financial resources
Initial investment to startup a business
Market understanding (identifying potential clients, and developing a sustainable business model)
Limited Collaboration and Networking (contacts)
Access to advanced technologies
High competitive market
Difficulties in differentiating from existing competitors.
35. On a scale of 1 to 5, how would you rate the f**ollowing statements in the ecological restoration secto**r? 1 being strongly disagreeing and 5 strongly agreeing.
The number of companies is high
The sector is growing
The degree of product/service differentiation is high
High fixed costs
36. On a scale of 1 to 5, How would you rate **the impact of the following indicator on competitive rivalry**? 1 being strongly disagreeing and 5 being strongly agreeing.

The high number of companies intensifies the competitive rivalry of the sector
The growth rate intensifies the competitive rivalry
The degree of product/service differentiation intensifies the competitive rivalry
Fixed costs intensify the competitive rivalry
Section 6: Education, knowledge and skills development
37. How would you **rate the current level of training and education** on ecological restoration solutions for practitioners? 1 being very low and 5 being very high.

APPENDIX 4: Practical Approach about the Activities and Services provided by Ecological Restoration businesses

Through an exhaustive search of the websites of companies providing ecological restoration services, the following table summarises the main activities and services that were found during the research process and which cover the breadth of the sector:

Activities relate to ecological restoration	Services provided
Management and conservation of natural resources	• Biological monitoring of fauna and flora • Inventory of natural elements • Investigation programs • Forest and Natural Space Management • Management of hunting and livestock resources • River engineering works • Restoration of mining activity in forest areas • Natural parks • Management of protected spaces • Fire surveillance
Forestry engineering	• Hydrological-forest restoration projects and preventive forestry • Infrastructure projects and public use • Fire prevention plans • Forestry work management
Forest planning and land use planning	• Forest management projects • Technical forest management plans
Studies in the natural environment	• Biodiversity, protected spaces and landscape studies • Environmental impact assessment and environmental surveillance • Inventories of gardens and green areas • Public use strategy in the natural environment
Forest resource mobilization	• Exploitation and marketing • Forest plantations • Forestry work
Climate Change	• Greenhouse gas inventories in large areas • Carbon footprint studies • Development of carbon market projects

Training in advanced technologies in the forestry and environmental sector	
Environmental Studies for industrial activities with impact on the natural environment	• Environmental impact studies and environmental sustainability reports. • Hydrological and water pollution studies. Flood studies.
Control of pests and exotic species	
Nurseries and plant producers	• Seed banks
Waste management	• Management of landfills, eco-parks, waste plants, composting plants
Integral management and control of the water cycle	• Sanitation and water treatment networks
Improvement and optimization of agricultural, forestry and fishing operations	• Prevention, control and eradication of any disease or pest • Prevention plans and analysis of chemical, biological (pests and infectious agents) and environmental risks • Sustainable Agriculture
Big Data, Data Science and Blockchain applied to sectors such as agriculture, forestry and fishing resources	

Source: Own elaboration through a search on websites of ecological restoration businesses.[27].

[27] https://agresta.org/; https://biocyma.com/; https://www.tragsa.es/es/Paginas/default.aspx; https://www.vaersa.com/cas/; https://entornonatural.org/; https://www.offset-trail.com/; https://www.eulen.com/es/; http://www.medixxi.com; https://www.innocampo.es/; https://foresa.net/; https://www.ibersyd.com/; https://geoscan.es/; https://geambiental.com/; http://www.ekos-eeco.com/; https://adraingenieria.com/; https://www.ambiental-sl.es/; https://www.aspasl.com/; http://www.atclave.es/inicio.htm