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Enhancing Place-Based Prosperity Through Anticipatory Innovation Governance: Insights from the Biellese Territory

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1 Introduction

The Biellese territory, located between the cities of Milan and Turin, is an emblematic example of challenges and opportunities that characterize many European industrial areas in a transition phase. Biella has a rich and prestigious textile heritage, but today is struggling to move beyond its glorious past and reinvent itself for the future. Over the years, several challenges have weakened the vitality of the region, including global economic transformations, population aging, infrastructural fragility, and deindustrialization. Despite these difficulties, the area still offers many valuable resources: a significant natural and cultural heritage, a still-active entrepreneurial network, and the presence of several innovative actors working for the regeneration of the territory.

This report is the result of multidisciplinary work carried out during the ASP Winter School 2025, with the goal of applying the principles of Anticipatory Innovation Governance (AIG) to a specific territory. VinPRO group worked on the Biella case, trying to define a possible strategy where economic regeneration, environmental sustainability and social inclusion can coexist by enhancing local resources and anticipating future dynamics.

After a thorough analysis of the Biellese territory and the identification of its main challenges, this report presents a potential integrated solution. The paper is therefore divided into multiple sections, each contributing to a better understanding of both the context and the proposed solution.

Section 2 is an introduction to the Biellese territory, highlighting its geographical features and its economical and cultural background. Biella is a complex territorial system, where natural elements (such as the Cervo River), historical infrastructures, and cultural heritage coexist. Nevertheless, this section also addresses the main challenges that this territory is facing such as depopulation, de-industrialization and many more.

Section 3 examines the Political, Economic, Social, Environmental and Technological factors that have an influence over Biella and its province using the PESET framework, a tool used by marketers to analyze and monitor the macro-environmental factors that have an impact on any entity. From the political point of view, state incentives support sustainable innovation, while from the economic point of view there is strong dependency to the textile sector and some difficulties in exporting the product. Socially, the territory shows a demographic disequilibrium, while the environmental analysis highlights the issues of the textile sector and the necessity of circular models. In the end, at the technological level, some opportunities that use artificial intelligence to relaunch productivity are explored.

Section 4 analyzes the main stakeholders that contribute to the economic and industrial growth of Biella. Among this we can find innovation hubs (SellaLab, MagnoLab), banks, startups, textile supply chain and public sector. Each of these plays a strategic role in the promotion of a new economic model based on innovation and sustainability.

Section 5 is the main contribution of this essay, containing our solution to the challenges addressed in Section 2. The main idea is to create a virtuous cycle that attracts people, private and public investors starting from creating an innovation hub that incubates startups in Biella territory. The project also aims to recover unused industrial buildings and to improve public infrastructures for access to the territory. In this section, the issues related to the raising of the prices and the proposals for the energetic sustainability are also discussed, considering the possibility to use the micro-hydroelectric power and engaging national companies such as ENI and ENEL.

Section 6 after analyzing different possible business models that can be applied to the aforementioned proposal, tailors a solution to the Biella territory that includes a Waste-to-Value approach, public-private partnerships and social economy models.

Section 7 addresses the financing problem: every solution needs a good financing scheme in order to be successful. Private equity, green loans and social economy are analyzed, highlighting their impact and any potential issues that can arise. The idea is to combine public and private investments to ensure financial stability and social impact.

Section 8 explains how different collaborative governance model can be used to manage the territorial ecosystem towards the proposed solution, identifying in the *public-driven innovation* model the most suitable one. This means that the public sector plays a central role, open to collaboration with private actors and civil society. This approach can maintain a balance between long-term strategic vision, stakeholder engagement, and operational efficiency. It is particularly suitable for addressing complex challenges, such as infrastructural regeneration, sustainable reindustrialization, and tackling depopulation.

In summary, this report presents a systemic and anticipatory vision for the revitalization of the Biellese. After the analysis of the territory and its main challenges, the VinPRO group has developed a proposal that leverages local resources, attracts investments, reduces unemployment, and fosters sustainable and inclusive development. In a historical moment where territorial resilience is crucial, Biella could become a point of reference for experimenting with an innovative model of regional regeneration.

2 Introduction to Biellese Territory

Located in Piedmont, a region in the north-west of Italy, the city of Biella stands between the big cities of Milan and Turin, at the base of the Alps. Due to its strategic location and the natural resources of the territory, over the years the city has developed its industrial sector, especially the textile production. Today, Biella counts a population of about 42000 inhabitants, but in the last decades it is decreasing more and more. Despite that, Biella has a strong cultural and industrial identity.

It is important to analyze the city's territory to understand the challenges that the city is facing, such as depopulation and deindustrialisation, and to try to develop sustainable solutions for the future.

2.1 Characteristics of the territory

The territory of Biella is characterized by different elements (natural, cultural and industrial) combined together. First, Biella managed to develop thanks to the abundance of **natural resources** in the area. Without a doubt, the main resource is related to the presence of several rivers, in particular the *Cervo River* that runs through the city. Historically, this river has allowed not only the textile industry to grow, providing energy and water for processing, but also the Stone and Construction Culture that grew in this region. If the Cervo River can be considered as the *Cardus* of the city of Biella, the *Decumanus* is represented by the Panoramic Road that travels through the hills surrounding the city. These and the mountains located on the territory provide other resources, especially for tourism: the map in Figure 1 shows all the routes accessible by bike in the city. Instead, in South of Biella, across the Cervo River, agriculture has developed, especially for rice and wine production. The territory of Biella is facing a process of change, from a Production Landscape to a Productive Landscape, and it is still evolving.

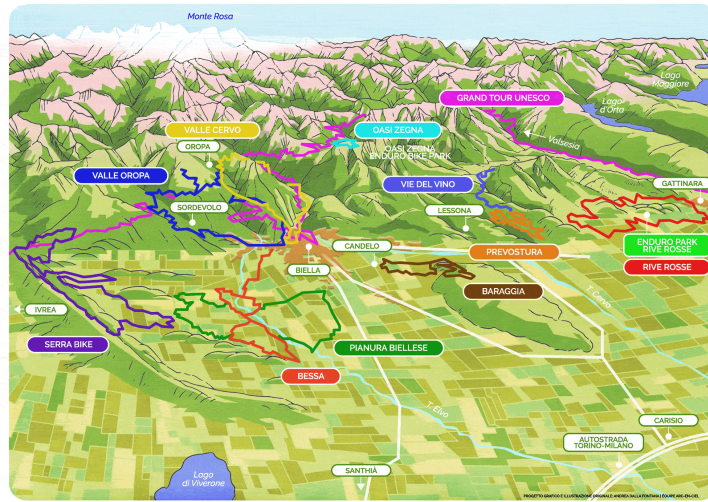


Figure 1: Tourist routes near Biella

In terms of location, Biella is in a strategic position, because it is located near the intersection of two important European highways: the E64 that connects East and West Europe and the E26 that connects North and South Europe. This is related to another important feature of the territory: the **industrial heritage**. Several industries have created their business in the Biellese territory, but the most prolific one is the textile production, developed since the introduction by Pietro Sella of the mechanical looms from England and Belgium at the beginning of the XIX century, powered mainly by the river (Gruppo Banca Sella, 2008). Several prestigious firms kept their locations on the territory and continue to operate to a global level, such as Ermenegildo Zegna and Loro Piana. Intesa San Paolo Group in May 2024, based on Istat data, reported that 60 % of manufacturing workers were employed in the textile production and clothing industry (Intesa Sanpaolo, 2024). However, the evolution and innovation process of the industry has caused the abandonment of several old buildings that are now abandoned.

Not least important for the description of the territory are **culture and**

innovation that have always characterized the city. In fact, several projects and foundations, such as the *Premio Federico Maggia* and *Fondazione Sella* aim to promote urban regeneration and valorize the local heritage. For example, *Woolscape Project* has been developed to promote the recovery of unused plants, through sustainable design solutions and to tell the history of Biella wool (Woolscape, 2025). This is a sign of the evolution that the Biellese territory is trying to do, from a development model based on textile industry to a more diversified economy, based on innovation, sustainability, and tourism. However, this process requires clear strategies and effective governance.

2.2 Territorial challenges

Today, the Biellese territory is facing several challenges that influence economic and social development. Firstly, Biella shows an **aging of the population** and a continuous **depopulation process**. In fact, from Istat data (OsservaBiella, 2023) it is possible to see that since 2021 to 2023 the population is slowly decreasing. Furthermore, the *'old-age dependency ratio'* (ratio of people over 65 years of age and people 15-64 years of age, multiplied by 100) is still increasing since 2002 (Figure 2). Consequently, people over 65 years of age represent 30% of the whole population and the average age is increasing (Figure 3). This involves higher healthcare and pension costs and a shrinking workforce.

The aging population and depopulation are also related to young generations who tend to move to bigger and more dynamic cities such as Turin and Milan looking for job opportunities and for studying, leaving behind villages and valleys in the Biellese. Attempting to reverse this situation, several strategies have been aimed at attracting new generations: in 2019 Biella managed to become one of the *Creative Cities* of Unesco (Regione Piemonte, 2019) and this has provided a great opportunity for both the

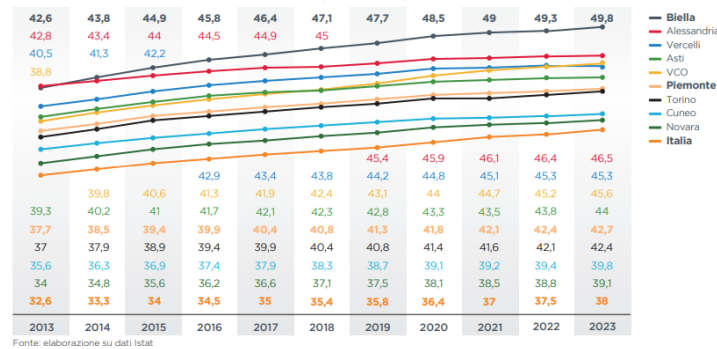


Figure 2: Old-age dependency ratio since 2013.

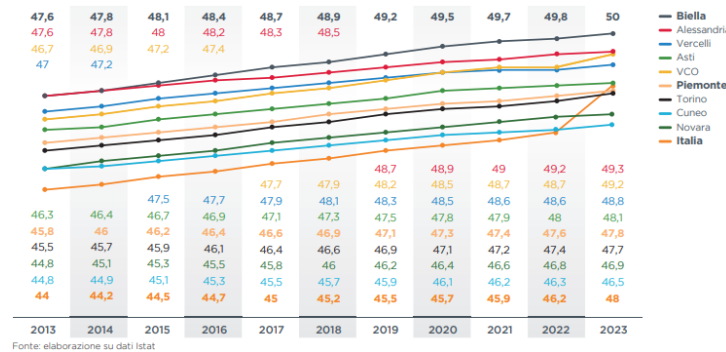


Figure 3: Average age of Biella population through the years.

population and the territory.

Another issue that has affected the city of Biella in recent years is the **De-industrialisation**, related to limited entrepreneurial opportunities and, especially for the textile industry, the loss of segments of the value chain. In fact, the number of firms in the biellese textile sector decreased by 37.5% between 2010 and 2020, while the number of employers decreased by 23.5% (Rosso, 2021). This means that a lot of buildings have been abandoned over the years, and today many of these are dilapidated and need a regeneration to support the development of the territory. This has been possible for the woolen mill of the Sella family (Figure 4) which has been renovated and is today the site of *Fondazione Sella* and is the



Figure 4: Maurizio Sella woolen mill, over the Cervo river.

symbol of the Biellese heritage (Fondazione Sella, 2024). These trends have to be reversed, creating innovative job opportunities. However, each possible solution must be sustainable and based on a circular economy, related to a low environmental footprint. This is fundamental because today **environmental issues** are also central to innovation, according to Agenda 2030 (ONU, 2025). In fact, in general, the textile industry is often associated with a high concentration of chemicals in rivers, as, for example, reported in a 2011 Arpa case study (ASL Biella, 2011). Innovation in the textile industry might mean the employment of eco-friendly fibers and the introduction of low-impact processes.

Considering the problem of **fragile infrastructures**, another issue that must be considered is the connection of transport to the main Italian cities. In fact, despite the presence of the high-speed railway connecting Milan and Turin passing nearby, there is no train station serving Biella, causing inefficiency for the connection with the city. This fact makes Biella less attractive to commuters and investors. Recently, some initiatives have been discussed to make the connection more efficient (Provincia di Biella, 2024), but they are often difficult to realize and require large investments.



Figure 5: Sacro Monte di Oropa

One last challenge the community has to face and that is related to the transport problem is trying to **develop tourism** and use it as a resource, leveraging its cultural heritage and the Biellese territory. For example, places such as the *Sacro Monte di Oropa* (Figure 5) and the surrounding natural landscape could be valid opportunities to attract more people. Improving transport connections could enhance the potential for tourism by making Biella more accessible.

3 PESET analysis

A PESET analysis is a framework or tool used by marketers to analyze and monitor the macro-environmental (external marketing environment) factors that have an impact on an organization, company, or industry. It examines the Political, Economic, Social, Environmental and Technological factors in the external environment.

- **Political** factors are all about how and to what degree a government intervenes in the economy. This can include – government policy, political stability or instability in overseas markets, foreign trade policy, tax policy, labour law, environmental law, trade restrictions and so on.
- **Economical** factors have a significant impact on how an organisation does business and also how profitable they are. Factors include – economic growth, interest rates, exchange rates, inflation, disposable income of consumers and businesses and so on.
- **Social** factors, also known as socio-cultural factors, are the areas that involve the shared belief and attitudes of the population. These factors include population growth, age distribution, health consciousness, career attitudes and so on. These factors are of particular interest as they have a direct effect on how marketers understand customers and what drives them.
- **Environmental** factors have become important in the last 15 years due to the increasing scarcity of raw materials, pollution targets, doing business as an ethical and sustainable company, carbon footprint targets set by governments.
- **Technological** factors affect marketing and the management in three distinct ways: new ways of producing goods and services, new ways

of distributing goods and services, new ways of communicating with target markets.

In this section, we'll conduct a context analysis on the Biellese territory using the aforementioned framework.

3.1 Politics

The political landscape affecting Biella's business environment is characterized by a complex interplay between local, regional, national, and European governance structures.

The Italian government provides several incentives for the industrial re-conversion and sustainable development of local enterprises. In 2022, for example, the *Ministero dello Sviluppo Economico (MISE)* provided a €20 million fund to the textile industries in Prato and Biella to support competitiveness and strengthen manufacturing skills through innovative and sustainable programs (Bittau, 2022). Building on this, the *Legge Made in Italy* (Ministero delle Imprese e del Made in Italy, 2025) offers further grants for SMEs and extends Geographical Indications (IGP) to non-agricultural products. These measures reinforce the heritage and global positioning of the Biella textile industry.

Looking forward, several pending political developments may affect Biella's business environment. Local industries must be capable of taking advantage of these opportunities.

3.2 Economy

Biellese region is not experiencing its economic prime. The economy remains heavily dependent on Textile industry, still one of the best in the world, which accounts for 60% of local exports. However, this sector is highly influenced by the increasing competition of global actors. Unlike

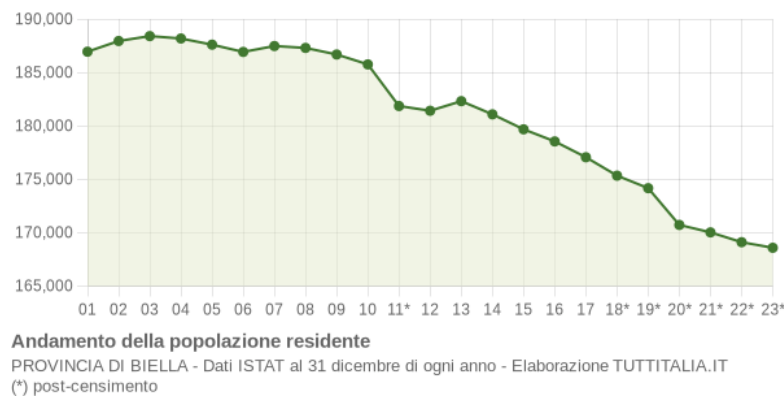


Figure 6: Resident population trend

the other provinces in Piedmont, which have seen export growth, Biella recorded a 12.2% drop in 2024 mainly due to a 13,4% decline in textile export (LaProvinciaDiBiella, 2024).

Mirroring national trends, the number of local retail shops has steadily declined over the past decade, but the 27.3% decrease since 2012 places Biella among the hardest-hit cities in Italy (LaProvinciaDiBiella, 2025).

3.3 Society

Figures 6, 7, 8 (Tuttitalia, 2025) represent the demographics of the Biella Province. When looking into this data, we can find out that Biella province is the second oldest province in Italy: first province for over 64 citizens and second-to-last for under 14 citizens (Urbistat, 2022).

This demographic imbalance translates into a shrinking and aging consumer base, with increased demand for healthcare, social services, and age-friendly products, while reducing the market for youth-oriented goods and limiting the availability of a young, adaptable workforce.

In addition to this, the Biellese territory is also facing a growing skills mismatch in the labor market. In 2024, 65% of local businesses made job offers but 55% of them struggled to find a match (PrimaBiella, 2025). To

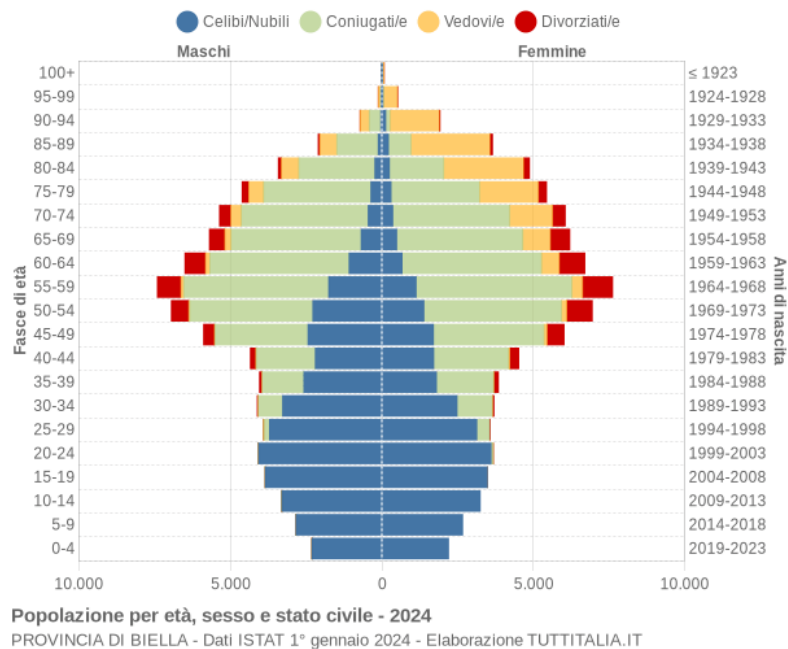


Figure 7: Population by age, gender, and marital status - 2024



Figure 8: Trend of population with foreign nationality

meet this demand, immigrants have become a key resource, significantly supporting the local economy (Barazzotto, 2024).

3.4 Environment

One of the biggest challenges in textile industry is represented by environmental sustainability. The major problem is the huge amount of water needed: it is estimated that a single T-shirt requires up to 2700 liters of water. The textile industry also contributes significantly to air pollution through processes like spinning, weaving, and finishing synthetic fibers.

Because of all this concerns, and also following European Union action plan, the goal is to make Biellese textile industry a circular economy by recycling fibers, reducing waste, and adopting renewable energy sources (Pratrivero, 2025).

To ensure product safety and sustainability, companies are obtaining certifications like OEKO-TEX® STANDARD 100 and the Global Organic Textile Standard (GOTS), which set benchmarks for textiles tested for harmful substances and organic textile requirements, respectively. These efforts also respond to the growing criticism of fast fashion, whose low-cost, high-volume production model contrasts sharply with Biella's emphasis on quality, durability, and long-term environmental responsibility. In this context, the Biellese model represents a counterpoint, offering a slower, more conscious alternative rooted in tradition, innovation, and ecological awareness.

3.5 Technology

Technology is always evolving and keeping up with the times can be challenging in such a fast-paced world. The latest disruptive innovation is certainly represented by Artificial Intelligence, that has completely changed industries, services and education.

Usage of AI in textile industries, for example, include optimizing production processes through data analysis, reducing downtime via predictive maintenance, managing inventory more efficiently to minimize waste, inspecting fabrics for defects using computer vision, refining dyeing processes to decrease errors, and offering customers personalized options in colors, fabrics, and designs (TeamSystem, 2025).

4 Stakeholders

The Biellese territory has always been an area with a strong connection to the textile industry. In the last past years, it has experienced a period of industrial weakness that has caused loss of jobs and an ongoing economical local crisis. Sustainability, technological innovation, and public support are crucial aspects for relaunching the sector, as well as for integrating new production models. One of the pillars of the Biellese tradition has always been the textile sector that, since the 19th century, turned Biella into a leading center in the production of fine fabrics with an attention to the processing of high-quality wool. In the 20th century, outsourcing of production to low-wage countries, and increasing international competition, have put pressure on the sector. In this context, local stakeholders play a key role in defining and implementing targeted strategies to stimulate the economic and industrial growth of Biella. Six main actors can be found as crucial: Magnolab and Sella lab play the role of mentors and supporters to startups and to the entire textile supply chain. The public sector is in charge of minimizing administrative hurdles. In figure 9 the relationships among the stakeholders are captured.

4.1 SellaLab

Stakeholder description. Sellalab represents an advanced innovation and entrepreneurship hub developed by Gruppo Sella, designed to stimulate technological advancement and business model innovation. Founded in 2013, it has served as a strategic ecosystem for startups, SMEs, and large enterprises, providing essential resources, networking opportunities, and expertise to foster organizational growth. The hub's main objective is to facilitate digital transformation by offering mentorship programs, business acceleration initiatives, and access to state-of-the-art tools and technologies. In these years, it has collaborated with 18 different innovation

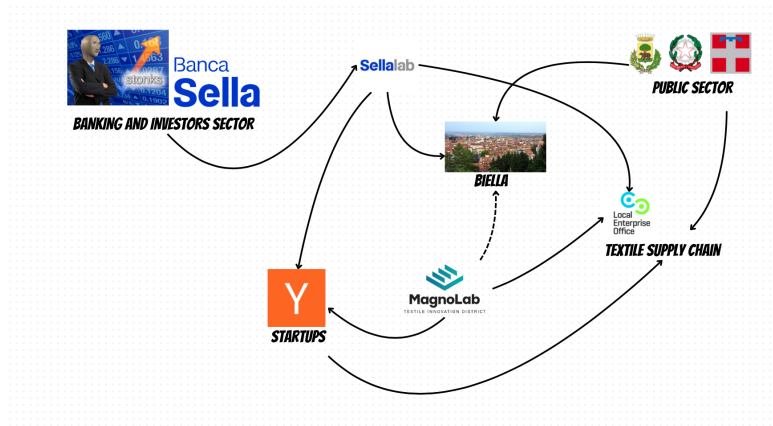


Figure 9: Stakeholders relationships.

Note: direct relationship for solid lines, indirect relationship for dashed lines.

hubs, 20 universities and 450 start-ups. It operates at the intersection of multiple industries, with a particular focus on fintech, artificial intelligence, and sustainability. Through various events, training programs, and workshops, Sellalab enhances the skills of entrepreneurs, enabling them to address contemporary market challenges. More than 600 events were organized implying the presence of thousands of people. In 2024, for instance, in Lanificio Maurizio Sella the fifth edition of BiDigital took place, implying conferences featuring more than 50 speakers, workshops and an audience of startups, companies and professionals.

Activities, Operations and Connection with the Biella Region. Sellalab fosters business growth through a wide array of activities and services. It provides coworking spaces equipped with advanced technological infrastructure, ensuring a collaborative and productive environment. The hub runs acceleration programs to support early-stage startups in scaling their operations and refining their value propositions. As a matter of fact, 36 millions of euros were invested in emerging realities in collaboration

with dPixel. These investments don't include mentoring and consulting services from industry experts to ensure better market strategies. Additionally, it engages in strategic partnerships with universities and research institutions, extending its focus on digital transformation to supporting traditional businesses in integrating cutting-edge technologies. Sellalab is a catalyst for technological innovation and economic diversification in the Bella territory. By offering a space that encourages entrepreneurial experimentation and digital transformation, it facilitates the integration of Biella's traditional industries with new technologies. The hub helps local businesses, especially in the textile sector, transition to smart manufacturing and data-driven decision-making, ensuring the region remains competitive in the global marketplace. Moreover, Sellalab strengthens the local economic ecosystem by connecting entrepreneurs with international markets, venture capital, and industry experts, thus reinforcing Biella's position as a dynamic industrial hub (Banca Sella, 2015).

4.2 Magnolab

Stakeholder description. Magnolab is a leading innovation center specializing in the development of sustainable materials and cutting-edge technologies for the textile industry. It enables the cooperation of 17 companies with a share of international presence provided by the norwegian Norsk Tekstilgjenvinning. It is a center of advanced research and development facilities dedicated to improving the environmental footprint of textile production. Circular economy as well as material science bounded to technological evolution are the key principles of this reality. The collective aim is working on developing new eco-efficient fibers, dyes, and producing methods that significantly reduce environmental impact. According to Ilbiellese, it has around 2,400 employees and a total turnover exceeding 500 million euros (Bonoli, 2018).

Activities, Operations and Connection with the Biella Region. Testing services, consulting on circular economy processes, and access to cutting-edge laboratory facilities are the practical activities supporting R&D in textile industry. For instance, companies like Savio Macchine and Corino Macchine have been involved in collaborations to implement advanced machinery that optimizes the textile production process, improving product quality and reducing material waste. The center provides Biella's textile producers with the resources needed to transition to sustainable material sourcing, closed-loop production processes, and environmentally friendly manufacturing techniques (Magnolab, 2025).

4.3 Public sector

Stakeholder description. The public sector in Biella consists of local, regional, and national government bodies responsible for regulating industrial activity, supporting economic development, and ensuring the sustainable growth of the region. They provide crucial infrastructure and foster public-private partnerships through the means of financial incentives and initiatives to promote workforce development.

Activities, Operations and Connection with the Biella Region. Policy development, grants and subsidies promote digital transformation through smart industry programs, and they facilitate access to EU funding for green technologies. Local institutions, such as the Municipality of Biella, encourage textile companies to obtain environmental certifications like Global Organic Textile Standard (GOTS), guaranteeing sustainability of textile products, or the OEKO-TEX Standard 100, which certifies the absence of harmful substances in textiles. According to La Stampa, in 2022, the Ministry of Economic Development allocated 10 million euros to support the Biella textile industry through design, experimentation, research, and de-

velopment activities (Benassi, 2017) (Regione Piemonte, 2020).

4.4 Banking sector and investors

Stakeholder description. Funding projects fostering digital transformation and emerging technologies is part of the role of commercial banks, private equity firms, and venture capitalists. They are the subjects able to offer loans, equity financing and advisory services to business. Credito biellese as well as Gruppo Sella are contributing with strategic financing for sustainability projects in the biellese territory (Conti, 2019).

Activities, Operations and Connection with the Biella Region. Banking sector, through a variety of formulas, has been able to sustain throughout the years, the textile field in Biella. Examples are able to highlight this quote: according to Il biellese, Banca Sella sponsored the 20th edition of Milano Unica, the Italian Textile Exhibition, which was held in Milan from February 4th to 6th, 2015 and was a showcase of the opportunities hidden in the Biellese territory; The MagnoLab project received a total investment of 10 million euros, allocated to the purchase of cutting-edge machinery and the development of a circular economy system in the textile sector (Banca Sella, 2021).

4.5 Textile supply chain

Stakeholder description. Biella supply chain remains central in economic identity. It embraces all stages of textile production, from raw material sourcing (such as wool and cotton), spinning, weaving, dyeing, to finishing. The region's textile supply chain is known for its high-quality woolen fabrics and its expertise in premium textile products. It includes local manufacturers, suppliers, distributors, and designers, working in syn-

ergy to produce fabrics that are sold both domestically and internationally (Nesti and Fabbrini, 2018).

Activities, Operations and Connection with the Biella Region. The biellese textile supply chain is shifting to resource-efficient manufacturing including material sourcing, production optimization, quality control, and distribution. Manufacturers in Biella are increasingly investing in smart textiles, eco-friendly fibers, and energy-efficient processes with an eye to traceability from the raw materials to the finished products (Fabbrini, 2020).

4.6 Start-ups

Stakeholder description. In 2021, Biella had 30 active startups, slightly decreased to 29 in 2022. Among them, only a few are dedicated to the textile field. Most of them, like Koodit e Biella Industrie Tessili, were supported by Sellalab (Silvestri, 2019).

Activities, Operations and Connection with the Biella Region. Startups in the Biella textile sector, although still relatively few compared to other technological sectors, are on the rise, with an increasing number of initiatives focusing on sustainability, digital innovation, and circular economy. These types of initiatives are often born from the combination of traditional know-how with opportunities offered by new technologies, such as 3D printing, the use of recycled or biodegradable materials, and the integration of artificial intelligence to optimize production. Most of them focus on innovative textile technologies such as VIBRAM S.p.a. or on Software and digital solutions for the textile sector like Koodit (Biella Start-up Hub, 2021).

5 Solution

The core of our idea was to incentive new startups to move to the Biellese territory. Our hypothesis is that such newly created ecosystem will be a pole of attraction for young entrepreneurs and their families. The presence of such young talented individuals in the territory will then support the growth of complementary services, that will support the depopulation. In our solution, we see the depopulation of the area starting a positive feedback loop, that is going to attract both public and private investments, with the creation of factories and laboratories, able to exploit such a skilled workforce. In order to complete the virtuous cycle, we imagine these newly emerging companies, providing infrastructures and housing to young startups.

In the paragraphs that follow, we are going to present our solution in a more structured and detailed manner, in order to fully understand the positive virtuous cycle that we have designed.

5.1 De-industrialization

Historically, the region around Biella has always been a reference point for the textile industry: we want to leverage this historical expertise to attract more startups in order to foster innovation in this field. It is important to notice, that we want to collocate our solution more on the highly expert innovative side of the manufacturing, instead of the commodity side of the textile production. In our opinion, it is very unlikely to attract enough investments to be able to restore international competitiveness of the region on such side, nor would it be savvy not to nurture the collaboration with technical institutions such as the Politecnico di Torino and Politecnico di Milano.

In order to accomplish this mission, we took inspiration from the H-FARM innovation hub. H-FARM(H-FARM, 2023) is an innovation hub based

in Roncade, near Treviso, Italy. Founded in 2005, it began as one of the first startup incubators in Europe and has since grown into a unique ecosystem that integrates education, entrepreneurship, and digital transformation. The campus hosts international schools, university programs, coworking spaces, and innovation labs, creating a vibrant environment for both students and professionals.

Its presence has brought significant strengths to the territory. By attracting students and startups from across Italy and abroad, H-FARM has positioned the Veneto region as a center for innovation and digital culture. It has supported the growth of a new entrepreneurial ecosystem, fostering job creation and new business opportunities. Moreover, it has contributed to the regeneration of rural land, transforming it into a sustainable and high-tech campus that has increased the area's visibility and appeal to investors, companies, and institutions at both national and international levels.

Drawing inspiration from this well-established and virtuous example, and building on the insights gained through our dialogue with numerous stakeholders across the territory, we propose the evolution of MagnoLab into a textile-focused counterpart of H-FARM — a hypothetical “H-Wool”. This envisioned hub would serve a dual purpose: on one hand, it would become a center for innovation in the production and processing of wool, encouraging experimentation with sustainable materials, advanced manufacturing techniques, and circular economy practices; on the other hand, it would act as a cultural and educational anchor point, dedicated to preserving and promoting the rich heritage of the wool industry.

By combining research, education, and entrepreneurship under one roof, H-Wool could foster collaboration among startups, established companies, artisans, researchers, and students. It would aim to revitalize the wool sector by making it more attractive to younger generations and by opening up new possibilities for value creation through design, story-

telling, and technological integration. In doing so, H-Wool would not only strengthen the local economy but also reinforce the identity of the region as a forward-looking textile innovation district rooted in tradition.

After a bootstrapping period in which the newly H-Wool innovation hub will start attracting talents and startups, it will start to nurture an innovation ecosystem, that is likely to attract even more companies and young talented individuals, pulled by the technological infrastructures and low-cost housing facilities provided by the incubator itself. More startups in the region will also bring more knowledge can be exchanged with (or gained from) for existing companies that will decide to invest into the Biellese territory.

On top of this, H-Wool's ambition to become a wool-focused innovation campus would serve as a powerful magnet for students from across the country who are eager to immerse themselves in the complexities of this renowned industry. By relocating to the area, they would have the opportunity to explore the intricate details of wool production and processing, engaging directly with a tradition that is deeply embedded in the history and identity of the territory. At the same time, they would be exposed to the latest technological advancements and sustainable innovations, allowing them to bridge past and future in a uniquely integrated learning experience. This convergence of heritage and forward-thinking development would make H-Wool not just a place of study, but a living laboratory for the textile industry of tomorrow.

5.2 Fragile infrastructures

As stated above, more companies coming to the territory means more need for offices and working spaces, which may be a challenge for the Biellese area. Many infrastructures are already existing in the territory, even though often they became dilapidated after falling in disuse for a long

time. However, restoring such infrastructures to create innovative working spaces and housing facilities, is the right thing to do in order to bring again value to the territory.

During our stay in Oropa, we discovered that the territory of Biella is rich in old industrial buildings—factories that once played a central role in the region’s economy but now stand abandoned and dilapidated. Rather than seeing these structures as lost assets, we see in them an opportunity for regeneration. Our idea is to offer these buildings for rent or sale at low prices to co-working operators or innovation-focused organizations willing to invest in their renovation. Once restored, these spaces could be rented out to newcomer startups, providing them with affordable and inspiring environments in which to grow.

This solution brings several advantages. It provides much-needed working spaces in areas where available land is limited, helping new businesses find a foothold without the need for new construction. It generates revenue from buildings that are currently unused, turning a burden into an economic resource. It creates social and visual impact by transforming neglected, decaying structures into vibrant, functional spaces that contribute to the local identity. Finally, it stimulates the local economy by creating work opportunities for construction companies and artisans involved in the renovation process. In this way, what began as a challenge becomes a multi-layered opportunity to breathe new life into the territory.

The other main infrastructural problem of the Biellese area is the insufficiency of means of transport: for example, there is no highway access, and direct connections to Turin are quite limited during the day. Transportation represents one of the most classic examples of network effects: the more rides occur each day, the more people are encouraged to choose public transport over private cars. As the number of users increases, so does the revenue for transportation providers, which in turn enables reinvestment and service improvement.

Currently, the public transport system in the Biellese area has not yet reached the critical mass required for these network effects to take hold. Usage remains limited, and the quality of service has not progressed to a point where it can consistently attract new users.

We believe that our proposal to attract more companies to the area has the potential to serve as a catalyst for this transformation. An influx of businesses would increase both the demand for passenger mobility and the need for efficient goods transportation. This rise in demand could finally activate the network effect, leading to a virtuous cycle of improvement in the overall transportation infrastructure.

The benefits of such a shift would be twofold. On the economic side, both existing and incoming companies would benefit from improved logistics and easier connections to national and international markets. On the social side, residents of the area would enjoy better public transport services, enhancing accessibility and quality of life across the region.

5.3 De-population

(ISTAT, 2023) We have described in detail the reasons why we can address this problem in the previous sections, however we are going to address ways and challenges we can achieve such. As stated before, the renovated infrastructures, the newly created housing facilities and the improved transportation infrastructure will support the repopulation of the Biellese area. However, the pushing motor that is going to invert the depopulation trend, will surely be the emerging industrial sector, that will require a specialized workforce able to fill the newly created job positions in startups and companies. This has the potential to not only solve, but totally reverse the problem of the depopulation that it affecting the examined territory, where people leave to relocate to larger cities, due to a lack of opportunities in the Biellese area.

Inverting this de-population trend, however, may pose some risks that we have to properly address using the Anticipatory Innovation Governance model (OECD, 2021).

A useful reference point is the recent situation of the housing market in Milan. There, a sharp increase in housing demand, combined with a limited supply, led to a dramatic surge in rental prices. In some cases, renting a 9 m² double bedroom exceeded €1200 (Vazzana and Liguori, 2024b).

To prevent a similar scenario from unfolding in the Biellese area, we recommend taking proactive and preventive measures. Specifically, we suggest that public institutions implement regulatory limits on housing prices. This would help ensure that, as the area becomes more attractive and populated, housing remains accessible and does not replicate the affordability crisis seen in larger urban centers.

5.4 Environmental issues

An increase in population and the relocation of more companies to the Biellese area inevitably lead to a higher demand for energy. Given the mountainous and complex territorial conformation of this region, achieving full energy self-sufficiency is unlikely in the short term. However, it is still possible to take meaningful steps toward improving the area's energy resilience and reducing dependency on external sources.

One promising direction lies in looking to the past for inspiration. Historically, the Sella (Sella foundation, 2020) family implemented an innovative solution to power their textile operations by purchasing a long strip of land along the Cervo river. They carefully engineered the terrain to channel a portion of the river in a nearly horizontal path. This artificial deviation allowed them to accumulate potential energy, which was then released through a controlled drop to activate a turbine and produce mechanical

energy used to drive the spinning wheels in their factory.

While mechanical power is no longer essential in modern industry—since electricity can now be easily converted into mechanical motion—this same principle can be repurposed today for clean electricity generation. By installing a small hydroelectric turbine in the existing channel system originally developed by the Sella family, a portion of the local energy demand could be met with a renewable, site-specific source. Since some of the foundational infrastructure is already in place, the cost of reactivating and updating the system could be relatively contained.

Moreover, this approach could be extended beyond a single site. Additional micro-hydroelectric plants could be installed along the Cervo river, forming a distributed energy network capable of supplying clean, locally generated electricity to both residents and businesses. These installations, due to their small scale and low environmental impact, could be harmoniously integrated into the landscape while contributing to the region's energy mix.

To bring such an initiative to life, the involvement of major energy players such as Eni or Enel could be crucial. Their technical expertise, funding capacity, and operational experience would ensure not only the feasibility of the microplants but also their long-term maintenance and integration into the national grid. Partnering with such actors would demonstrate a strong public-private collaboration, aligning with national goals of energy transition and sustainability, while directly benefiting the Biellese territory with innovation and infrastructural enhancement.

6 Business model

Choosing the right business model is essential to ensure not only innovating sustainability and effectiveness, but also the long-term impact of any territorial regeneration initiative, especially in complex and fragile contexts such as the Biella area. Here, the unique characteristics of the territory demand a careful balancing of diverse and often competing factors.

Business models, in this sense, must go beyond traditional logics to value creation. They must align with the principles of ecosystemic innovation and anticipatory governance, which advocate for collaborative and inclusive strategies specifically tailored to the local territory and context.

Today's challenges increasingly exhibit the characteristics of *cloud problems*: they are complex, interconnected, and difficult to predict. Addressing them requires territorial initiatives capable of simultaneously pursuing social, environmental, and economic objectives. In such a scenario, the choice of business models becomes pivotal in sustaining value generation, as it influences stakeholder engagement, solutions scalability, and alignment between financial sustainability and social mission.

6.1 Review of existing business models

A variety of business models have been analyzed, identifying the most suitable characteristics for supporting territorial development and ecosystem transformation. It is worth noting that these models are not mutually exclusive, and in many cases, hybrid configurations have proven to be more effective.

Circular Design emphasizes the importance of embedding sustainability principles from the very beginning of the design process. Products and services are conceived with durability, repairability, and modularity in mind. By designing for longevity within a closed resource loop, businesses adopting this model aim to reduce their environmental footprint while promoting

more responsible consumption. For example, customers are encouraged to return products at the end of their lifecycle, ensuring that materials are repurposed rather than discarded. However, while this model has the potential to radically reshape production and consumption patterns, its success depends on hard-to-predict factors such as supplier engagement and the creation of effective reverse logistics systems, with the risk of slipping into superficial *greenwashing*.

The Product-as-a-Service (PaaS) model rethinks the concept of ownership, allowing customers to access and use products without having to purchase them outright. In this system, the producer retains ownership and remains responsible for maintenance, upgrades, and end-of-life management. This setup incentivizes producers to design robust and easy-to-repair products, as their revenue depends on long-term usability, while customers benefit from ongoing support. PaaS proves effective by extending the product lifecycle, reducing resource consumption, and making high-quality products accessible to users who might not afford a large upfront investment. It also encourages customer loyalty, although it can lead to complex arrangements, particularly regarding usage agreements and responsibilities across the value chain.

The Waste-to-Value model focuses on reimagining waste as a resource. It involves the collection, processing, and transformation of industrial, agricultural, and even consumer waste into valuable new products. This approach not only tackles environmental challenges but also creates opportunities for entrepreneurial innovation and local job creation. For territories with a strong manufacturing heritage, such as Biella, this model can be particularly effective in revitalizing legacy industries and stimulating circular economies. However, it requires an infrastructure capable of efficiently managing and processing waste, along with rigorous quality control measures to guarantee the safety and reliability of repurposed products. In addition, shifting consumer perception is crucial to affirm both the economic

and symbolic value of goods derived from waste.

Inclusive Employment is a model that places social integration at the core of the business strategy. It aims to create meaningful job opportunities for people from marginalized or disadvantaged backgrounds, including individuals with disabilities, the long-term unemployed, or migrants – an approach that could be particularly relevant in the context of Biella. This model promotes equity and social cohesion, but it also requires tailored training programs and supportive environments that enable all workers to contribute effectively. Although its implementation may demand additional investment in human resource development, it is often supported by public incentives and brings reputational benefits to the organization.

Social Economy models, such as cooperatives and mission-driven foundations, represent alternative forms of enterprise that prioritize democratic governance, solidarity, and community benefit over short-term profit. Cooperatives typically operate under the principle of *one member, one vote*, ensuring an inclusive decision-making process that reflects a wide range of interests. Foundations, on the other hand, often provide financial support through grants or hybrid mechanisms, helping to launch and sustain impact-oriented projects. These models – exemplified by the Sella Foundation - are deeply rooted in local contexts and aim to promote inclusive growth. However, they may face challenges related to access to capital and limitations in scalability.

Public-Private Partnerships (PPPs) offer a framework for collaboration between public authorities and private actors. These arrangements enable co-investment in initiatives that generate public value, with risks and responsibilities shared across sectors. In some cases, outcome-based financing mechanisms are also employed to ensure that funds are disbursed only upon the achievement of specific social objectives. PPPs can mobilize significant investments and stimulate innovation in service delivery, but they require advanced governance structures and robust impact

measurement systems to ensure transparency.

Finally, financing models such as equity, debt, and hybrid instruments are key enablers for implementing business strategies. Equity financing involves the sale of shares to investors, often in exchange for a commitment to long-term growth or impact. Debt financing, including green loans and sustainability-linked bonds, provides capital while linking performance to environmental or social outcomes. Hybrid instruments, such as impact grants that convert into equity upon reaching specific milestones, provide flexible funding that adapts to performance and impact. The choice of financing should consequently reflect the business's mission, governance structure, and level of operational maturity.

6.2 Tailored business model for Biella

In the case of Biella, a territory historically rooted in the textile industry and currently facing challenges such as deindustrialization, depopulation, and deteriorating infrastructure, the most suitable strategy is a hybrid configuration. This approach combines the strengths of multiple business models, carefully aligned with the region's specific needs, socio-economic conditions, and latent assets.

At its core lies the concept of place-based anchoring. Territorial regeneration thrives on a strong institutional presence that serves as a catalyst for collaboration and innovation, fostering the development of a deeply rooted ecosystem in the Biella area. This ecosystem aims to attract startups, professionals, and educational institutions by building on the region's industrial heritage and local know-how, while promoting a renewed vision centered on sustainable production and entrepreneurship.

A key pillar of the proposed business model is the regeneration of Biella's many abandoned industrial buildings. Rather than expanding into undeveloped land, the strategy leverages existing infrastructure, convert-

ing disused sites into coworking spaces, labs, and offices. This approach aligns with Social Economy and PPP models, as it promotes cooperative redevelopment and shared public-private investment. It effectively tackles both spatial constraints and heritage preservation, while generating environmental, economic, and social value.

Attracting startups, particularly in the textile sector, contributes to building an innovation-friendly environment, with the goal of triggering strong network effects. As more companies settle in Biella, the territory gains value as a dynamic business ecosystem, encouraging knowledge exchange and supply chain integration. The region's established industrial expertise is combined with new technological and design capabilities, enabling a re-industrialization process that is both feasible and sustainable.

A complementary element of the business model is the integration of a Waste-to-Value approach. Though not the main focus, the presence of textile operations and incoming startups opens up opportunities to repurpose production waste. This could foster the creation of micro circular value chains, where residues are transformed into inputs for other sectors.

Social impact is also embedded in the model. Renovation and service-related activities can generate indirect employment opportunities for the local population, including disadvantaged groups. By engaging local firms, the redevelopment initiative reflects the principles of an inclusive employment model, fostering community participation and promoting equitable growth.

Education and training also play a strategic role within the business model, reflecting key principles of the Social Economy. The creation of a textile-focused innovation hub can attract students and researchers, fostering knowledge creation and talent retention. By investing in human capital and academic engagement, this approach strengthens territorial resilience while counteracting ongoing depopulation.

Financial sustainability is built on a blended capital mix. Public grants

and green loans support infrastructure, while impact equity fuels entrepreneurial growth. PPPs and outcome-based finance instruments ensure long-term alignment with territorial goals, with mission-lock clauses protecting the project's vision.

7 Financing

7.1 Private equity for energy and reindustrialization

As proposed in the solution chapter, the idea of using such important natural resources provides a very relevant opportunity for the territory in general providing value and investments essential for the overall economic benefit of inhabitants and each potential stakeholder. The Energy sector is constantly growing, basically since the beginning of human history, Italy and Europe in general lack of natural energetic resources like carbon, natural gas and fossils, enhancing home production of alternative sources can be of great interest both for institutions and companies. Environmental sustainability of all the projects to be financed in the energy and industrial sector must not be taken lightly, Biella is a region that can be badly impacted by climate change and its capabilities of growth as a territory might be highly compromised. Moreover, in the last years the European institutions are working and launching a bunch of “green” initiatives in order to fight global warming, they tend to create an economical damage to actors that do not have a sufficiently sustainable infrastructure or are unable to convert it efficiently. Losing control over this key point can severely compromise the future and possibilities of success of the entire ecosystem in the coming years. This observation can be applied also to the re-industrialization issue, infrastructures are highly relevant in the productive process and are one of the main parts of initiation and maintaining cost, while their impact on the environment should be as retained as possible, this is consider the energetic class of the building introducing a good criteria on whether using existing ones or investing in brand new infrastructure. Also the transport sector for raw materials and final products delivery chains must be concerned about this issue, the industrial waste disposal has to be effective and avoid creation of environmental and public health problems.

It must be noted that investments in this sector require very large amount of money, but can create great interest for private companies and investors: as stated in the previous paragraph energy demand is always increasing and so is the percentage of renewable and alternative sources, moreover if also the objectives of industrialization and repopulation of the territory are reached this creates demand of energy sources by the very same impact ecosystem. The possibility of Private Equities or Venture Capitals coming from abroad and arriving in the region can also foster high impact innovation coming from local entrepreneurs in a region that culturally lacks in this aspect especially in the last decades, their presence will also provide demand for startups present in the incubator and innovation center that we propose to be the core part of the ecosystem. Regarding the aforementioned environmental sustainability issues, proper funds must be selected among those that are focused on impact and ESG objectives, in fact an eventual not committed fund, even though with greater financing capabilities, could also accidentally create environmental and public health problems ruining the entire project for the innovation ecosystem (Preston, 2021).

7.2 Green loans for infrastructures

As previously explained infrastructures in the region are old and fatigued, our idea is to revitalize the existing ones, using historical buildings for the incubators, campus and new industries implants. This is yet an approach that tends to respect the environment and the cultural or architectural heritage of the region. Of course this idea is attractive also due to lower costs with respect to construction of new buildings making it more sustainable for potential investors and the public sector. Another important part of the infrastructures is the transportation sector, where it is necessary to potentiate the train line making it more capillary inside the territory, the wanted

effect is to enhance the railway transportation of goods and people since it emits less pollutants, the train is also a very valuable solution to reach the bigger centers of Turin and Milan.

Since the infrastructure goal is still very linked to the environmental one, the main idea can be to invest gradually on it, at least from the public sector and educational institutions by means of Green Loans or Sustainability-Linked Bonds. These three options offer very good opportunities but can be exploited in very different ways.

Green Loans can be obtained through bigger public institutions like the European Union and traded through local banks, like Banca Sella, which will have the task of investing the money properly in projects or start-ups/companies devoted to the ecosystem and to reach the environmental sustainability goals.

SLBs pave the way to the capital market making it possible for the ESG oriented investors to participate, moreover these options become tradable. The point to pay attention to is the Sustainability Performance Targets (SPT), which basically defines what kind of parameters define the interests on the debt subscribed, choosing proper and reasonably reachable SPTs is necessary before committing to such types of bonds (WorldBank, 2021).

7.3 Social economy for repopulation

Revitalizing the territory and attracting young people to work and move together with their family, even though initially will be a direct consequence of the achievement of all the other objectives, it will become consistent only when a renovated, young and inclusive social environment is realized in the territory. Moreover, investing in social inclusion will attract immigrants coming from foreign countries, mostly from North Africa, who are currently experiencing several issues in integrating with the local population in the

whole continent. Immigrants can be a very large resource for the territory and Biella can be one of the best places to immigrate to, offering work at fair conditions and an inclusive environment.

These types of investment are generally performed by foundations, which will provide grants based on specific social objectives to be met. In this way the different organizations funded can focus on impact returns rather than bringing financial returns to themselves. In fact these grants must not be refunded as long as they serve the public interest. Grants will serve to fund social inclusion projects, if they will work, assisted to the entire impact ecosystem, a favourable environment for immigration will be created and the wanted repopulation will take place (Carchano et al., 2021).

8 Collaborative governance model

Collaborative Governance is a powerful method for addressing public problems and seizing opportunities to improve government service and strengthen communities. In a collaborative governance approach, multiple government entities or a group of diverse stakeholders from communities, government, non-government organizations (NGOs), and the business sector collaborate on a public problem or opportunity, debate issues, pool ideas and resources, and produce an outcome. Collaborative governance occurs as a neutral arrangement where the views of all participants are given balanced consideration. Collaborative governance can produce better outcomes than one person or organization could produce alone—outcomes that are creative, well vetted, broadly supported, and better able to stand the test of time (Jim Johnson, 2020).

Different governance models provide varying approaches to coordination and decision-making, each with distinct structural and functional characteristics. Some models are characterized by a vertical hierarchy, reflecting a top-down system where authority and decision-making power are concentrated in a central body. In contrast, horizontal governance models emphasize decentralized structures, fostering collaboration among stakeholders and promoting shared responsibility. Beyond the degree of centralization, governance models also vary in terms of the formality of institutional arrangements—ranging from rigid, formalized agreements to more flexible, informal networks. Additionally, these models differ in their underlying objectives: while some are designed around a unified, shared goal, others accommodate multiple, sometimes divergent, aims among participating actors. This diversity reflects the adaptability of governance structures to different contexts, policy domains, and stakeholder dynamics.

The public-driven innovation model was identified as the most appropriate governance framework for managing the territorial ecosystem in relation to the proposed solution. This model is characterized by a strong orientation toward public sector leadership, emphasizing state intervention and strategic support, while simultaneously incorporating the engagement of private sector actors. Central to this approach is a formalized mechanism of collaboration, typically operationalized through Public-Private Partnerships (PPPs), wherein the public sector assumes the role of investor or enabler, and the private sector functions as the service or infrastructure provider. The rationale for selecting this model lies in its alignment with the objectives of the proposed solution, particularly in fostering the development of infrastructure and essential facilities. Furthermore, this governance model conceptualizes citizens primarily as end-users or beneficiaries, which directly supports the overarching goal of addressing regional depopulation—one of the critical challenges identified in the preliminary analysis of the area.

The public-driven innovation model prioritizes public sector leadership while actively integrating private sector capabilities to address complex territorial challenges. This model is particularly suited to contexts where public institutions take initiative in shaping innovation agendas but recognize the added value of private expertise and resources. Rather than operating through rigid hierarchies, it allows for a more flexible governance dynamic that supports shared responsibilities and mutual contributions.

One of the defining characteristics of this model is its emphasis on infrastructure enhancement, product development, and the promotion of technological advancement, with citizens positioned as key end-users of the resulting innovations. Financially, it relies heavily on partnership-based arrangements that balance public investment with private sector engage-

ment. Its strength lies in enabling a more adaptable form of governance, combining formal agreements with space for informal cooperation. This structure fosters a multi-objective approach that is responsive to the evolving needs of the territorial ecosystem, making it a pragmatic choice for addressing multifaceted issues such as demographic decline and regional development.

8.1 Advantages of using public-driven innovation model

Communities with deep historical roots and longstanding industrial traditions often exhibit resistance to radical transformation, favoring a “stick to what we know” approach. This cautious attitude toward change, however, need not be viewed negatively. In many cases, incremental adjustments can yield significant improvements by optimizing existing systems without disrupting the cultural or socio-economic fabric of the community. Moreover, excessive or rapid optimization may be counterproductive, particularly when the benefits sought extend beyond purely economic gains to include social cohesion, cultural preservation, and local identity.

For regions such as Biella—where legacy industries and established governance practices remain influential—a moderately formal mechanism of collaboration, with clearly defined roles and responsibilities, is especially appropriate. This approach maintains continuity with familiar, historically top-down governance structures while introducing elements of cooperation and shared decision-making. It enables gradual evolution rather than abrupt disruption, making it a suitable model for fostering innovation in a way that aligns with the community’s values and pace of change.

8.2 Connection between the model and highlighted issues of the territory

This model is particularly well-suited to infrastructure improvement, as it places public sector leadership at the core of long-term strategic planning and coordination efforts. Infrastructure projects—whether related to transportation, energy, digital connectivity, or public services—are typically capital-intensive and require sustained investment, which aligns with the public sector’s capacity to act with a long-term vision and policy continuity. Given that infrastructure represents a foundational investment for territorial development, it is common and often necessary for the public sector to take a leading role in its development and management. Moreover, the public-driven innovation model supports multi-level governance, enabling alignment and cooperation across local, regional, and national authorities. This is particularly important in cases where infrastructure challenges span multiple jurisdictions or depend on external funding sources such as national recovery plans or European Union programs. The model’s structured yet flexible design allows for coordination among stakeholders while ensuring that strategic goals are not fragmented across levels of government. In this way, it provides the institutional coherence and financial coordination required for effective, large-scale infrastructure renewal.

To address the challenge of depopulation, the public-driven innovation model positions citizens as central beneficiaries by promoting urban development, job creation, and access to improved public services—all of which contribute directly to enhancing quality of life. By fostering new economic opportunities, particularly through reindustrialization and the revitalization of traditional sectors, the model can help retain younger generations and encourage the return of skilled individuals who may have migrated elsewhere. These efforts are further reinforced when accompanied by targeted incentives for startups and small to medium-sized enterprises (SMEs),

which stimulate local entrepreneurship and diversify the economic base. In addition to economic revitalization, the model places significant emphasis on the development of social infrastructure, including education, health-care, housing, and public transportation. These components are essential to creating livable and resilient communities, and play a critical role in ensuring long-term demographic stability. By integrating these priorities into a coherent governance strategy, the public-driven innovation model offers a pragmatic and people-centered approach to reversing population decline in historically industrial regions such as Biella.

Reindustrialization is a central objective that aligns closely with the principles of the public-driven innovation model. Through strong public sector leadership, the model enables the identification of strategic industrial priorities and facilitates coordinated investment in emerging and traditional sectors. In regions like Biella, which possess a rich industrial heritage but have experienced economic decline, this model supports the revitalization of existing assets while encouraging the adoption of advanced technologies and sustainable production practices. By leveraging Public-Private Partnerships (PPPs), the model mobilizes both public resources and private expertise, fostering an innovation ecosystem that can support industrial diversification and competitiveness. Moreover, the public-driven innovation model is conducive to establishing favorable conditions for business development, including infrastructure upgrades, workforce development programs, and support for research and innovation. Special attention can be directed toward incentivizing small and medium-sized enterprises (SMEs) and facilitating their integration into regional value chains. This strategic, coordinated approach enhances local capacity for production and innovation, laying the groundwork for long-term industrial renewal and economic resilience.

The public-driven innovation model is well-suited to address the challenges

posed by fragile landscapes and environmental issues, particularly in regions like Biella, where natural ecosystems and rural landscapes are integral to both cultural heritage and economic activities. The model's emphasis on public sector leadership ensures that environmental considerations are integrated into the strategic planning process, allowing for sustainable development practices that balance economic goals with environmental preservation. Public authorities can play a pivotal role in coordinating conservation efforts, promoting eco-friendly technologies, and implementing policies that mitigate environmental risks. In the context of fragile landscapes, the model supports multi-level governance, ensuring that local, regional, and national stakeholders collaborate on managing natural resources, biodiversity conservation, and climate resilience. By fostering partnerships with private sector actors, the model also encourages the development of green technologies and sustainable infrastructure, which can contribute to both ecological protection and the revitalization of local economies. Furthermore, the model's focus on social infrastructure, including education and public awareness, is crucial for engaging local communities in environmental stewardship and fostering a culture of sustainability. By aligning economic development with environmental protection, the public-driven innovation model offers a holistic approach to managing fragile landscapes while promoting long-term ecological and socio-economic resilience.

9 Conclusions

The Anticipatory Innovation Governance model in the Biellese region has the potential to transform the zone into a vibrant and sustainable innovation ecosystem: by incentivizing startups to settle in the area, the region can attract new talent and investments, creating a virtuous cycle of economic and social development. Our proposal to transform MagnoLab into “H-Wool” aims to reach this goal, by exploiting the region’s historical textile vocation. H-Wool will make MagnoLab become an innovation and training hub that will draw companies and students from across the country and more.

Addressing infrastructural challenges, such as redeveloping abandoned factories and improving public transportation, is crucial for supporting economic and social growth. Renovating unused buildings can provide the necessary workspaces required for the transformation we envision, while at the same time generate revenue and create positive social impacts on the territory. A public transportation enhancement has the potential to trigger a network effect that will benefit both businesses and residents, helping to shape the future of the Biellese territory.

Countering the depopulation trend requires a proactive approach to prevent issues like rising housing prices, as we recently observed in other cities. Our idea of limiting housing prices is a way to anticipate the problems experienced by other places, and avoid them altogether: we believe it will avert a housing crisis and make the Biellese region an attractive place to live and work.

Investments in the energy sector and reindustrialization will generate significant opportunities for the territory, attracting private equity and venture capital, while still ensuring economical and environmental sustainability. An initial investment in this direction can be realized through funds focused on ESG objectives, to support this sustainable innovation and

growth.

Revitalizing existing infrastructures and utilizing historical buildings for incubators and campuses can be a way to facilitate this process, still respecting the environment and the cultural heritage of the region. Gradual investments through Green Loans or Sustainability-Linked Bonds can improve railway transportation and reduce environmental impact.

A tailored business model for Biella, combining multiple strategies, can address the region's specific needs and leverage its latent assets. Place-based anchoring and the regeneration of abandoned industrial buildings can create a dynamic business ecosystem. Attracting startups, particularly in the textile sector, can trigger strong network effects and foster knowledge exchange. Integrating a Waste-to-Value approach can create micro circular value chains, enhancing sustainability.

Our model is packed with social impact, generating direct and indirect employment opportunities for the local population, including disadvantaged groups. Engaging local firms in the redevelopment initiative fosters community participation and promotes equitable growth.

Education and training play a strategic role towards attracting students and researchers to a textile-focused innovation hub. Our solution aims to invest in human capital and academic engagement, to strengthen territorial resilience and counteract the ongoing problem of depopulation.

Financial sustainability is built on a blended capital mix. Public grants and green loans will support infrastructure, while impact equity can fuel entrepreneurial growth. PPPs and outcome-based finance instruments have the capability ensure long-term alignment with territorial goals, with mission-lock clauses protecting the project's vision.

The public-driven innovation model is particularly well-suited for improving the existing infrastructure, as it places public sector leadership at the core of strategic planning and coordination efforts. This model supports multi-level governance, enabling alignment and cooperation across

local, regional, and national authorities. It addresses depopulation by promoting urban development, job creation, and improved public services, thus enhancing quality of life and retaining younger generations. Reindustrialization is facilitated through strong public sector leadership, coordinated investment, and Public-Private Partnerships, fostering industrial diversification and competitiveness. The model also integrates environmental considerations into strategic planning, promoting sustainable development practices and green technologies.

Finally, investments in social inclusion can attract young people and immigrants, creating an inclusive and dynamic social environment. Foundations and grants can support social inclusion projects, contributing to repopulation and community vitality.

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