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Article

Practicing Multilevel Governance: The Revision of the Piedmont Regional Territorial Plan

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Abstract: The regional level plays a relevant role in spatial governance and planning in Europe, as it constitutes the most suitable scale to both program European Union funding and territorialize international development strategies. In this light, regional spatial planning instruments play a crucial role in translating general objectives and recommendations (e.g., those included in the UN 2030 Agenda for Sustainable Development) in place-based implementation practices. This contribution reflects upon the implementation of a methodology aimed at engaging a multidisciplinary team of students in the revision of the Piedmont regional territorial plan (PTR), developed in close cooperation with the regional public administration. This problem-based learning activity supported the integration of supranational strategic objectives and funding streams with the regional territorial development priorities. In so doing, it represents a possible way to practice multilevel governance in concrete terms, employing the PTR as a meaningful catalyst.

Keywords: multilevel governance; regional territorial plan; indicators; strategies

1. Introduction

In recent decades, spatial governance and planning in Europe has become an increasingly multilevel activity. This is a direct consequence of the broader European integration process that started in the aftermath of the Second World War, in turn contributing to the consolidation of a so-called European Union (EU) multilevel governance [1,2]. In particular, European politics and policies have been progressively reshaped by a dual process of centralization and decentralization. Authority in many policy areas has, at the same time, shifted upwards to the supranational level of the EU and downwards towards the regional and local levels that gained increasing influence over the lives of their citizens [3].

Within this increasingly complex framework, the regional level plays a particularly relevant role, as it has been identified by the European Commission as the most functional level at which to program and manage the distribution of the European Structural and Investments Funds [4]. In particular, in several countries, the regional public administrations are required to develop Regional Operation Programs within the framework of the EU Cohesion Policy Programming periods, thus tailoring European and national priorities to the specific characteristics of their territories [5,6]¹. At the same time, and perhaps more importantly, the regional level constitutes the more detailed scale at which the international and EU development strategies are territorialized, hence the occasion to match the more general objectives and recommendations included in documents such as the UN 2030 Agenda for Sustainable Development with the differential characteristics and needs of the places. This means, on the one hand, that the regional level has been subject to growing Europeanisation pressures, in turn leading to the continuous adjustment of institutions, instruments, and modus operandi to better accommodate the inputs coming from the EU [7]. On the other hand, it constitutes the ideal level to conjugate from a place-based perspective the implementation of strategic development objectives and the



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programming of resources, in a way that the former provides guidance to territorialize the latter, so that the latter meaningfully contributes to achieve the former [8,9]. How this coordination should occur, according to what means, and what results it is producing in the different countries are, however, subject to debate, as highlighted by a number of studies recently developed on the matter [4–6,10–12].

Acknowledging the crucial role that regional spatial governance and planning tools may play in the promotion of a more sustainable and inclusive development of the European territory, this contribution explores this issue in the context of the Piedmont Region, located in the northwestern part of Italy. In particular, the authors present a methodology that they developed to inform the process of revision of the Piedmont Regional Territorial Plan (PTR—Piano Territoriale Regionale, in the Italian acronym), and then implemented in cooperation with regional officers and a task force of students. The research adopts a problem-based learning approach, implemented as part of an interdisciplinary pedagogical path promoted by the Politecnico di Torino and labeled “Innovation Ecosystem for Impact”. This pathway involved the participation of students with backgrounds in engineering, architecture, planning, and design, who worked for one year under the supervision of experts in industrial innovation, sociology, planning, evaluation, and territorial cohesion policies. The module also involved representatives of regional and local public administrations, with the overall objective of favoring the understanding of the potential socio-economic and territorial impacts of the proposed solutions. Conjugating the needs of the Piedmont Region to revise and update the PTR with the attempt to engage high-profile students within an interdisciplinary, problem-based learning activity, the proposed methodology supports the integration of supranational strategic objectives and funding streams with the regional territorial development priorities, leading to the development of complex intervention strategies for each of the 33 Territorial Integrated Areas (AIT—Ambiti Territoriali Integrati, in the Italian acronym) identified by the PTR (Figure 1). In so doing, it represents a possible way to practice multilevel governance in concrete terms.

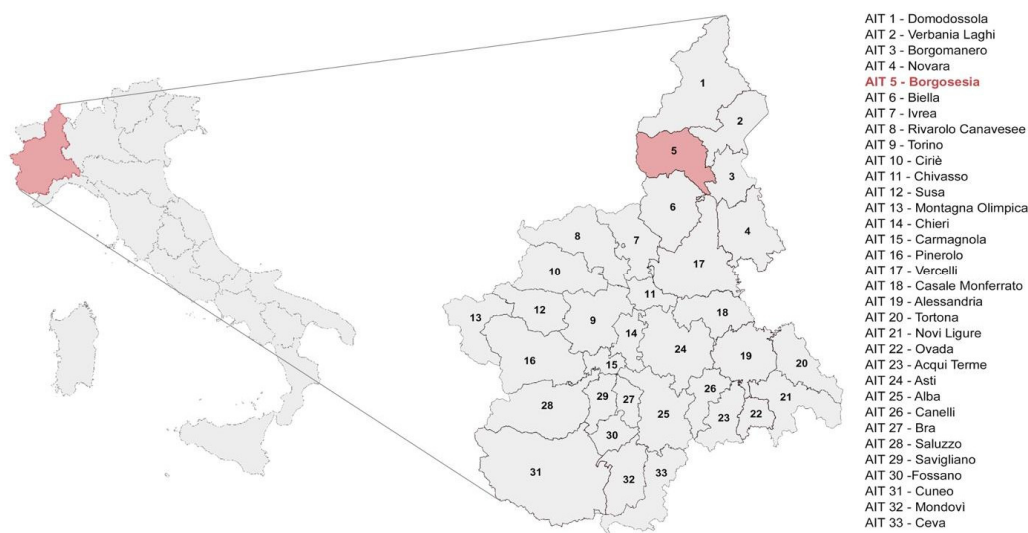


Figure 1. The localization of the Piedmont Region in Italy, the AITs, and the case study (AIT 5). Source: authors’ own elaboration.

After this introduction, the Italian spatial governance and planning system is briefly sketched out, with particular reference to the Piedmont Region and the role that the PTR can play as a meaningful catalyst of multilevel territorial governance. Then, the methodology adopted to inform the revision of the PTR is presented, and its different phases are described in detail. The next section focuses in turn on the results achieved through the implementation of the described methodology, with particular reference to AIT5. A concluding section rounds off the contribution, summarizing the activity and

reflecting upon the added value of the proposed methodology, as a meaningful way to conjugate strategic objectives and funding from a multilevel, place-based perspective.

2. Setting the Context: The Piedmont Regional Territorial Plan as a Meaningful Catalyst of Multilevel Governance

The Italian Constitution identifies spatial governance and planning as concerning all conceptual, regulatory, and management aspects relating to safeguarding and transforming the land as well as the protection of the environment. The spatial governance and planning system is still based on National Law 1150/1942 but, since their introduction in the 1970, regional governments have started to approve their own spatial planning laws, leading to an increasing heterogeneity and divergence of regional instruments and practices [13,14]. As a consequence of the resulting framework, spatial governance and planning is a highly multilevel activity, with competences assigned to different levels of government (state, regions, provinces, metropolitan cities, and municipalities; see Figure 2), organized in a mostly hierarchical way.

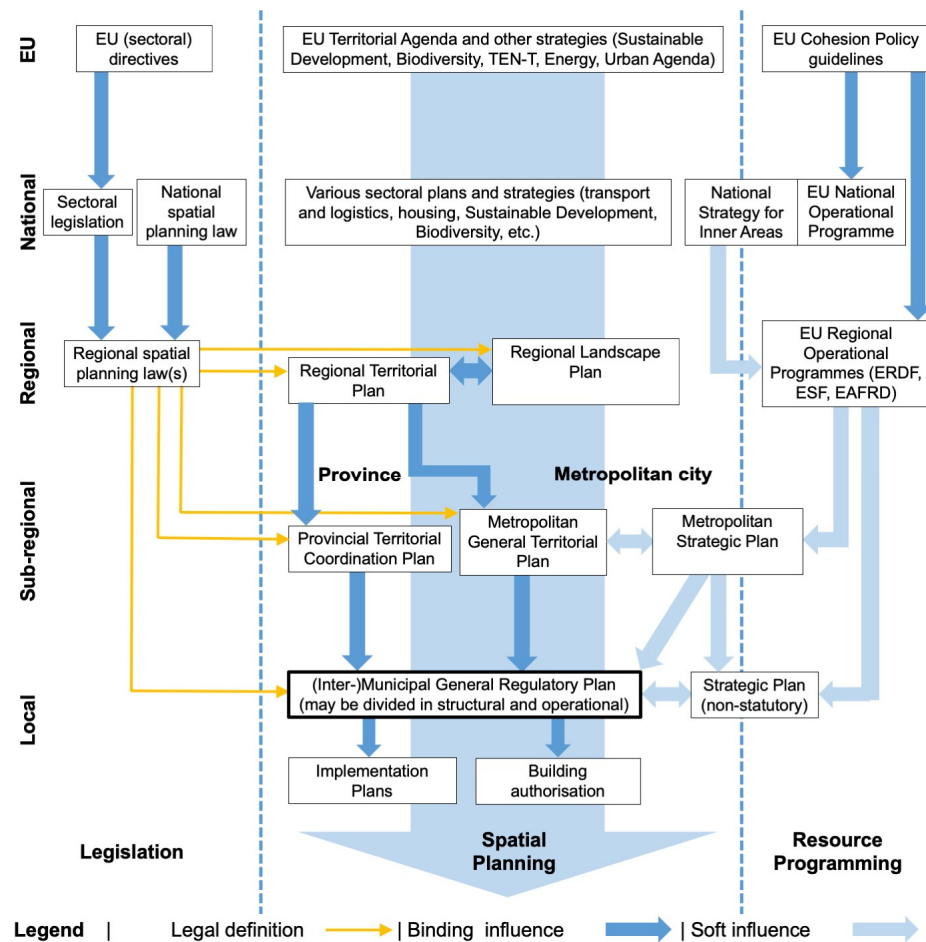


Figure 2. The organization of the Italian spatial governance and planning system (Source: [15]).

On the one hand, the production of spatial planning tools starts at the regional level, and is further specified and characterized by the provinces and the metropolitan cities, which are supposed to define orientations for the territorial transformation of their respective territories, and by the municipalities, which are entrusted with the preparation of local land-use regulation tools. On the other hand, a fertile activity of strategic planning and resource programming, inspired by the EU and organized by the national government, sees the regional level as its more detailed terminal.

In this light, the regional level represents the ideal catalyst of the Italian system of multilevel governance, as it should act as a virtuous hinge between the strategic objectives and funding priorities defined at the supranational and national levels and the spatial planning prescriptions produced by the lower levels, thus contributing to territorialize the former and provide them with practical implementation through the latter. The instrument that should serve this role is the PTR² that, according to the national legislative framework, shall define the region's main orientations and strategies for socio-economic and spatial development and address environmental protection and infrastructure networks.

Acknowledging the above, this research focuses on the Piedmont Region PTR and, in particular, on how the latter has attempted through time to territorialize the strategic inputs coming from supranational levels through the further subdivision of the regional territory into intermediate units positioned between the sub-national and the local levels, the already mentioned AITs (Figure 1). The AITs are defined as the ideal scale at which to detail the main elements composing regional policies in a place-based way, favoring their practical implementation through local actions [16]. In this light, the spatial matrix of the 33 AITs represents the development basis for the PTR, highlighting the dynamic connections that must be the subject of integrated planning [17]. The need to obtain an integrated vision on a local scale led to the decision to organize and connect information from these territorial units of intermediate size between municipal and provincial. This was proposed to analyze the territory according to a progressive scalar logic [16], starting from the local level represented by the AITs, moving on to provinces as aggregates of AITs, and arriving at regional and supra-regional networks that connect the AITs among themselves and with external territorial systems. The importance of the AITs derives from the fact that, at this local scale, it is possible to highlight the proximity relations between facts, actions, and projects that coexist and interact in the same places.

The definition of the AITs considers the relationships among subjects and the sharing of experiences and knowledge based on the enhancement of collective identities [18]. The idea is that the AITs allow such networks to form and consolidate, with the consequent possibility of shared visions and projects, in a process of co-planning with regional planning. The definition of the AITs is therefore based on a representation of the "habitual movements" of subjects from their municipalities of residence to those where urban services of a certain level are offered [16]. In this sense, they are aggregates of municipalities that, due to their size and territorial outline, are well-suited targets for the preparation of bottom-up development strategies [18]. Accordingly, the territorial nature of the AITs does not consist only in their physical delimitation, but also and above all in their potential to act as collective actors by valuing local capital. The design of the PTR according to the AITs aims to increase the understanding of socio-economic and territorial impacts, with a view to greater sustainability, of technological innovation, new business models, and public policies in various fields of application. The structure of the PTR thus intended should therefore allow for integration with the different types of superordinate planning present in the territory. Indeed, the AITs are a support device for the diagnostic, evaluative, and strategic phases of the PTR, with regard to the implications of choices at a local level, but they also play an important role in supralocal (regional, national, and European) network analyses and actions, since, in various respects, they can be treated as complex nodes of these networks [16].

Precisely with this in mind, the Piedmont Region has been questioning for some time how to represent and integrate the sustainability of development and the state of the environment in Piedmont on a spatial integration scale [19]. Therefore, in the framework of the 2030 Agenda [20], the levels of local planning and cities (or, in this case, city aggregates) are recognized as the context in which technological, economic, and social development can and should be pursued [21,22]. Consequently, it is necessary to adapt and localize the targets and indicators of the Sustainable Development Goals (SDGs) [23–27] and related policies and operations to be implemented in local policy processes [28]. Localization implies translating the global development agenda into approaches for pursuing results at

the local level [29–32]. In the Italian national context, Istat proposes an annual monitoring report on the SDGs, in terms of progress towards the 2030 Agenda targets [33]. The main national reference tool is the National Strategy for Sustainable Development (from now on called National Strategy), defining guidelines for the pursuit of sustainable development objectives in terms of environmental, social, and economic policies [20]. On this basis, the regions must define a Regional Strategy for Sustainable Development (from now on called Regional Strategy) to monitor their territory and produce empirical evidence and arguments on the contribution of regional policies to the pursuit of the 2030 Agenda priorities [20]. The Piedmont Regional Strategy [34] is the product of an articulated process, started in 2017, which outlined the areas and objectives that the region intends to pursue [34,35] with reference to the 2030 Agenda and in line with the National Strategy. It has been defined based on a Position paper [36], observing 52 representative indicators monitored by ISTAT (National Statistical Institute, the Italian acronym). On this basis, strategic regional objectives and lines of action are defined, and included into seven Strategic Macro-Areas of implementation, for which monitoring indicators are also provided.

Although this is a strategic tool, it is not directly integrated into spatial governance documents such as the PTR. To update the reading of the socio-economic and territorial components according to the Regional Strategy, the Piedmont Region has launched a plan to constantly update the structural reference framework of the PTR [19]. Among the various activities, Arpa Piemonte [37] and IRES Piemonte [38] have experimented with the integration of sustainable development at the AIT scale. In the document produced [39], a first attempt to localize the political action for sustainable development is proposed, through an updated picture of the socio-economic and environmental status of three sample AITs, selected as not only territorially diverse, but also environmentally, economically, and socially diverse.

This research parallels the ongoing experimentation, proposing in turn a survey of a selection of the 33 AITs, apt to integrate the dimension of sustainable development in the proposal of a transformation strategy for each of the territories analyzed. It should be emphasized that a plan has already been set in motion for the construction of the “Piedmont Sustainability Laboratory” precisely by the Piedmont Region, Arpa, and IRES, intended as one of the main implementation tools of the Piedmont Regional Sustainable Development Strategy [40].

3. Materials and Methods

This research focuses on issues related to territorial innovation and sustainable development. It investigates the current situation of the AITs in the Piedmont Region, proposing an analytical framework to measure the performance of these territories and defining strategies for improvement in line with the SDGs. In this sense, the research moved in parallel with the real PTR revision, in collaboration and exchange with representatives of the Piedmont Region. The analyses and methodological proposal were therefore also based on “in progress” documents that animated the discussion. In addition, the Regional Strategy was under approval at that time (approved in July 2022); therefore, some interlocutory exchanges with the Piedmont Region allowed for the definition of development strategies for the AITs in line with the development of updated goals.

In order to predispose an intervention strategy for each of the 33 AITs of the Piedmont Region, including principles of the Regional Strategy, a preliminary step consisted in an exploration and detailed study of the PTR and such a strategy, as well as reports provided by IRES Piemonte [41,42]. Then, a methodological framework was developed, structured into two phases, analytical and strategic.

The preliminary exploration and analysis of the PTR, first, aimed at (i) synthesizing the actions and objectives related to each of the strategic axes in the document; (ii) exploring sectoral themes of particular territorial relevance for the AIT at stake; and (iii) individuating a number of cross-cutting themes to further frame the work and develop meaningful links

among the sectoral themes. The PTR [16] collects some common outstanding elements of interest for the Piedmont Region, structured into 5 strategic axes of reference:

1. Land redevelopment, landscape protection, and enhancement;
2. Environmental sustainability and energy efficiency;
3. Spatial integration of mobility, communication, and logistics infrastructures;
4. Research, innovation, and economic-productive transition;
5. Enhancement of human resources and institutional capacities.

In addition to these 5 strategic axes, 6 “sectoral themes of territorial relevance” have been articulated through a discussion with the Piedmont Region representatives—as an update to the 5 already reported in the PTR:

1. Enhancing the territory;
2. Resources and primary production;
3. Research, technology, and industrial production;
4. Mobility, accessibility, transport, and logistics;
5. Tourism;
6. Territorial governance and cohesion.

Finally, 8 “cross-cutting themes”, not explicitly listed in the PTR, are conceived by the authors in coordination with the Piedmont Region policy-makers involved in the study, to help and direct the research towards a specific connotation and meaning, according to the needs and peculiarities of each of the AITs, which would further connote each specific directive. Such themes concern several sectoral aspects of territorial development and, therefore, potentially support multiple areas of intervention:

1. Climate change;
2. Redevelopment and regeneration;
3. Circular economy;
4. Efficient energy systems;
5. Interconnected mobility;
6. Risk prevention;
7. Competitiveness of the production system;
8. Digitalization.

In addition to the PTR, the reports produced by IRES Piemonte [41,42] were analyzed. Report [41] illustrates the results of updated analyses on the cognitive-structural components of the PTR and its AITs, in light of the new data available on the environmental, heritage, socio-economic, and infrastructural endowments aspects. Moreover, report [42] includes qualitative and quantitative indicator surveys to measure the performance of the AITs. The surveys are based on statistical data and constitute a list of indicators to be used for reporting performance values for each AIT and for ranking the AITs based on such performances.

Finally, the Piedmont Regional Strategy was analyzed, to frame the work on the AITs as a contribution to regional policies for the pursuit of 2030 Agenda priorities. The preliminary analysis of the Strategic Macro-Areas resulted in a framework to be verified in terms of integration in the PTR.

This preliminary exploration resulted in the development of the structure of two organization boards (see Sections 4.2 and 4.3), the analytical board and the strategic board, as templates for applying the methodological framework.

The analytical phase is aimed at understanding the current positioning of each AIT concerning the specific objectives of the PTR. The purpose of this phase is to outline the main characteristics of each AIT through the use of indicators, to define the individual performance, and the comparison among them, in terms of ranking. Also, it aims to better situate a sustainable intervention strategy, through the identification of relevant aspects of the Regional Strategy to be integrated. This phase is structured in 4 steps: (i) critical analysis of the specificities of the AITs with respect to the current general guidelines; (ii) analysis of performance against the indicator system proposed by IRES [42]; (iii) correlation with the

Regional Strategy indicators and Strategic Macro-Areas [34], reflecting on the integration between the PTR and Regional Strategy; and (iv) definition of the directives for the AIT, understood as actions to be pursued and based on the previous steps.

Accordingly, the analytical board consists of 2 general elements referring to all AITs and 5 site-specific elements, to be measured for each individual AIT considered.

The 2 general elements are identified as:

- General guidelines provided by the PTR and understood as common objectives to be targeted by each AIT;
- Specific objectives as a detailed declination of the general guidelines.

The 5 site-specific elements are measured as:

- Indicators defined by the PTR as measures of AIT performance;
- Relevance of indicators and their level of importance in each specific AIT;
- Relative AIT ranking with reference to the indicator considered;
- Correlation with the Strategic Macro-Areas of the Regional Strategy for SD aimed at identifying synergies or disconnections with the PTR;
- Directives understood as operational actions that each AIT could put in place to improve its positioning.

The output is an analytical board of each AIT completed to contain objectives, performance against the identified indicators, a ranking that displays the positioning of a specific AIT in relation to the others, and a potential correspondence with relevant aspects of the Regional Strategy.

The strategic phase is aimed at developing intervention strategies for each AIT, intended as complex policy and intervention packages that shall orient the future territorial development of the AIT from the perspective of sustainable development. The purpose is here to propose guidelines defining the priority issues for the development of each AIT. The strategic phase is structured in 4 steps: (i) correlation of the sectoral/cross-cutting themes for each AIT and of the directives previously identified; (ii) identification of funding sources and actors that can be involved and support the selected hypotheses of transformation and delimitation of their timing; (iii) consolidation of a multifaceted territorial development strategy for each the AITs; and (iv) assessment through a SWOT analysis, aimed at checking whether the proposed strategy for each AIT may be able to achieve the components of sustainable development identified in the Regional Strategy and Strategic Macro-Areas. Accordingly, the strategy board consists of 5 elements aimed to achieve the following:

- Highlight correlations between the directives identified for each AIT, the 6 “sectoral themes of territorial relevance” defined by the PTR, and the 8 “cross-cutting themes”;
- Identify the key actors and propose funding channels by hypothesizing the timing of implementation;
- Define an overall intervention strategy for each AIT, verifying the correspondence to the Regional Strategy for SD.

The output is a strategic board for each AIT, that is configured as a matrix of potential synergies between the various directives identified for each AIT after the integration with the sustainable development aspects considered in the Regional Strategy.

4. Results and Discussion

Following the presentation of the methodological framework, this section presents the case study and discusses the results achieved.

4.1. The Case Study: AIT5

To better clarify the methodological framework applied, the analytical and strategic phases are illustrated using the case study of AIT5 of the Piedmont Region to disclose the operational steps provided. AIT5 encompasses a mainly mountainous territory around the Sesia River basin with about 50,000 inhabitants and is equidistant from two major cities in northern Italy, Milan and Turin (Figure 3).



Figure 3. The AIT5 location, in relation to Milan and Turin. Source: authors' elaboration based on students' reports.

It is an area with considerable potential from an environmental point of view, internationally known for the many outdoor sports activities that can be enjoyed in all seasons (i.e., hiking, climbing, river activities, and winter sports), facilitated by the cableway connection with the Valle d'Aosta Region.

AIT5 is also characterized by the presence of an important national cultural and artistic heritage and industrial potential related to the fashion and textile and metal industries, exporting products worldwide.

Despite its favorable geographical location and significant naturalistic, historical-architectural, and industrial endowment, the potential of AIT5 is underutilized, playing a marginal role in the regional context. It has good accessibility to the highway and rail network, which is currently underdeveloped. Despite its proximity to the cities of Turin and Milan, much of its territory is not served by public transportation. Most of the mountainous part is not provided with international crossings, preventing transalpine exchange from an industrial and tourism perspective. The water and forestry resources in which AIT5 is rich are not used in synergy with energy production, defense, and the use of the natural environment even though they could be directed toward innovative rural development. A further important weakness is the paucity of health and education services of advanced training. Indeed, public healthcare is provided by a single unappropriated hospital which has been demoted and currently performs basic services. The population living in AIT5 must therefore rely on the few private services present or travel outside the AIT, even in emergency situations. Finally, there are no high-profile universities in the AIT, and potential students must leave for other territories. Also, AIT5 is characterized by a high rate of the socio-economic NEET (Not in Education, Employment or Training) phenomenon, mostly affecting young people between 15 and 34 years [43].

The reasons for these shortcomings may be (i) the stances of national actors who have in the past prioritized other territories, at the time more functional for political purposes; (ii) deficient integrated planning; (iii) the inability of local actors to organize the available resources and to put up a united front in the defense of the territory; and (iv) an inability to attract national and international investors.

Based on the strengths and weaknesses of AIT5, a number of macro-areas of analysis were then identified within which to orient the work. These are as follows (Figure 4):

- The need to invest in infrastructure connections;
- The improvement of health and education services;
- The enhancement of environmental and landscape resources in the mountains;
- The enhancement of tourism;
- The deepening of productive vocation and specialization.

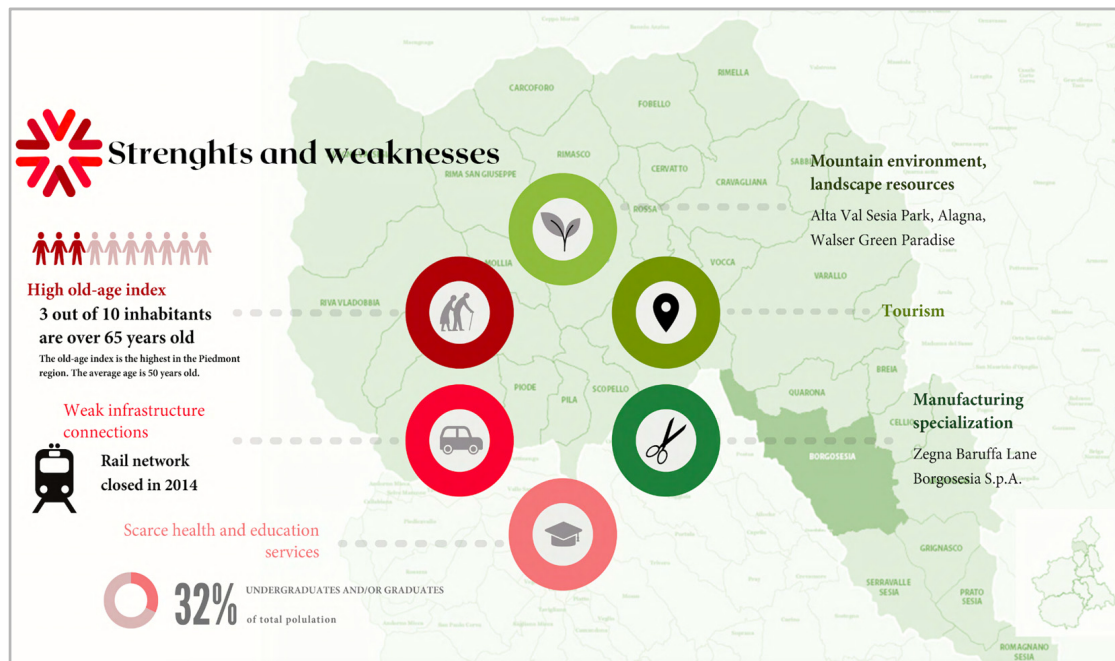


Figure 4. Identified macro-areas of analysis based on the strengths and weaknesses of AIT5. Source: authors' elaboration based on students' reports.

4.2. The Analytical Phase

The output of the analytical phase is an analytical board for each AIT considered (Figure 5). As an example, the steps conducted on AIT5 are illustrated in the following sections.

Step 1: Critical analysis of the specificities of the AITs

The first step of the analytical phase aims to provide a reflection on each AIT, by narrowing/broadening the view toward issues not included in the current PTR general guidelines.

Therefore, the analytical phase involves updating and revising the specific objectives that the PTR defined without considering the peculiar territorial characteristics of each AIT. This first step of the analytical phase checks the relevance of the objectives for each AIT under consideration.

As an example, for AIT5, it was deemed necessary to revise the specific objectives suitable for the PTR general guideline "1.2_Creating synergies between territories by encouraging collaboration between municipal, regional, national, and international governments". Indeed, from the analysis of the documents and the study of the territory, it appeared that the objective "2.6.2_Coordination and implementation of basin planning with land use planning" was too stringent. This was therefore eliminated and replaced with objective "5.3.3_Strengthening coordination within and among different institutional levels for efficient land governance", which emphasizes the importance of collaboration among institutions, as one of the major shortcomings of AIT5.

General guidelines	Objectives	Indicators		Ranking n/33	RSDS correlation with MAS	Directives
		Quantitative value	Relevance (1-5) Low: 1 - High: 5			
1.2: Creating synergies between territories by encouraging collaboration between municipal, regional, national, and international governments	1.7.1 1.8.2 2.6.2 1.8.5 3.1.1 3.2.1 3.3.1 3.3.2 5.3.3	Integrated supra-municipal planning: 30	5	10/27	MAS 6: 6.D	Enhance infrastructural networks
3.9: Investing / enhancing the field of innovation, distributing university hubs and research centers throughout the territory	4.1.1 4.1.2 5.2.2 5.2.5	1) Undergraduates and/or graduates (% tot. pop.): 32% 2) Total enrolled (high schools): 2.690 (n) 3) Enrolled in courses with specialization: 11 (n) 4) University courses: 0 (n) 5) HighTech Manufacturing + Research / University: 157 (n)	5	1) 28/33 2) 19/33 3) 30/31 4) 9/9 5) 30/33	MAS 1: 1A MAS 4: 4C, 4D, 4E	Establishment of universities

Figure 5. The analytical board defined for AIT5. Source: authors' elaboration based on students' reports.

Also, the specific objectives related to the PTR general guideline “3.9_Investing/enhancing the field of innovation, distributing university hubs and research centers throughout the territory” were strengthened through the inclusion of additional elements. For example, it was decided to include the specific objective “4.1.2_Identification of ways to foster local synergies and economies of scale among public and university institutions, research centers and businesses, and support youth entrepreneurship” so as to emphasize the territory’s need to identify innovative and profitable educational ways to enhance and support the industrial vocation of AIT5.

Step 2: Analysis of performance against indicators

The objective of step 2 is to understand the performance of each individual AIT against the indicator system proposed by IRES Piemonte [42].

The analytical board then defines the following:

- The performance of the AIT with respect to each indicator based on data collected by IRES Piemonte [42] and Arpa Piemonte [44];
- The relevance that each indicator takes in determining the performance of the AIT under consideration using a 1–5 scale, where 1 corresponds to low relevance while 5 corresponds to maximum relevance;
- The ranking of the AIT under consideration in relation to the AITs in the region as assigned by IRES Piemonte [42].

In AIT5, for example, the indicator “Integrated supra-municipal planning” has a performance of 30, measured in “number of municipalities in the AIT involved in unions and mergers” [41,42]. This performance places AIT in 10th place out of 33, despite the indicator’s high relevance. This confirms the concern of this area outlined in the PTR regarding the lack of adequate rail services and the need for highway connections.

Step 3: Correlation with Regional Strategy indicators and Strategic Macro-Areas

This step is aimed at reflecting on the integration between the PTR and Regional Strategy [34] to understand whether and how spatial governance tools are compared with the SDGs.

In the analytical board, each AIT is also described in terms of the potential correlation between the general guidelines of the PTR and the Strategic Macro-Areas indicated by the Regional Strategy to understand whether these elements are aligned or whether the PTR needs integrations.

In AIT5, for example, the PTR general guideline “1.2_Creating synergies between territories by encouraging collaboration between municipal, regional, national, and international governments” is related to the Macro-Area “6.D: Develop and promote international cooperation” [34]. The ability to contextualize activities in a global perspective is considered in the Regional Strategy as a fundamental sustainability element, making each territory capable of interpreting its own development patterns considering their consequences on other countries. This implies that territories must have the ability to carefully design and plan local actions by cooperating with other countries, each with its own competencies. The public administrations of AIT5 should build relationships with other public administrations in partner countries by concerting actions aimed at addressing certain development issues. In this sense, the PTR would need significant integration since the number of local authorities involved in such activities is decidedly small.

A further correlation identified for AIT5 concerns the general guideline “3.9_Investing/enhancing the field of innovation, distributing university hubs and research centers throughout the territory” and the Macro-Area “1.A: Develop economic forces/businesses of sustainability”. The Regional Strategy [34] stresses the need to (i) enhance clusters and synergies among businesses, research centers, and universities; (ii) strengthen the research system to make the territory attractive to talent and businesses; (iii) support the creation of innovative start-ups and research spin-offs; and (iv) encourage the gradual transition to more sustainable productions through research and the dissemination of innovative processes in the regional production fabric. The path toward achieving this sustainability

goal is fraught with obstacles for the Piedmont Region, which is characterized by small and medium-sized enterprises and limited economic strength. Accordingly, the PTR would need an update that includes the deployment of actions so that the production system can accommodate and/or develop new skills and opportunities from the growing digital and green technological frontiers.

Step 4: Definition of directives for the AIT

The last step in the analytical phase involves the formulation of directives understood as actions that each AIT should pursue based on the PTR general guidelines, specific objectives, the assessment of indicators, and integration with the Regional Strategy.

The directives constitute an implementation proposal for each AIT that updates the PTR. For AIT5, 42 directives have been identified. For the sake of simplicity, we take two important directives as examples, related to the PTR general guidelines “1.2_Creating synergies between territories by encouraging collaboration between municipal, regional, national, and international governments” and “3.9_Investing/enhancing the field of innovation, distributing university hubs and research centers throughout the territory”.

The first directive concerns the implementation of the infrastructure network, expanding the existing one between smaller urban centers, reopening the railway axis leading to major cities in northern Italy, and creating a highway connection within AIT5 (Figure 6). Based on the analyses, it emerges that this AIT is a closed and self-sufficient system from the point of view of flows, but, at the same time, it would benefit from an excellent road network that should be insisted upon to improve the regional and state connections, with enhanced accessibility and road system.

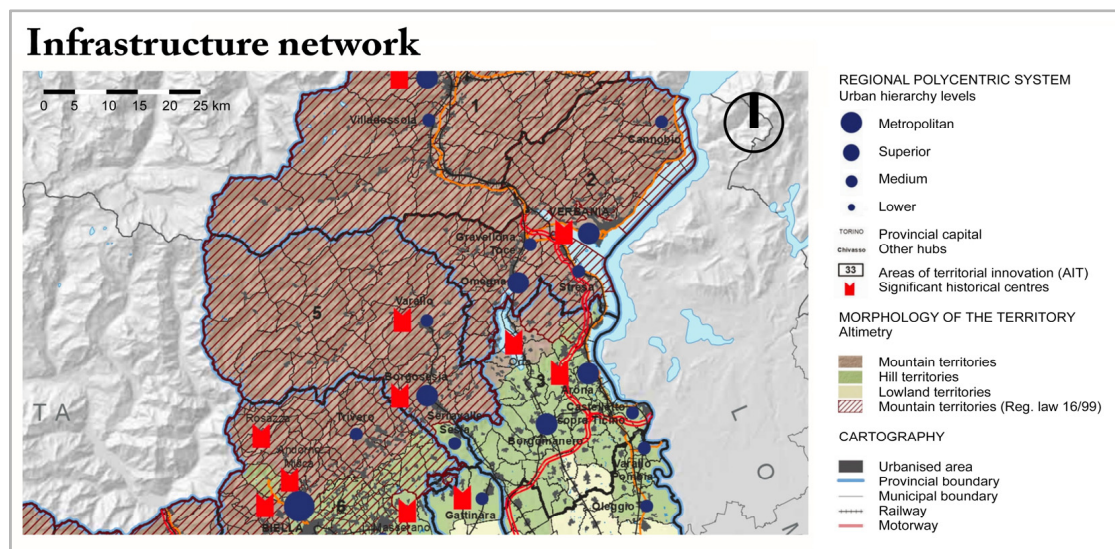


Figure 6. The implementation of the infrastructure network. Source: authors’ elaboration based on students’ reports.

The second directive, related to the general guideline 3.9, concerns high-profile education and research in terms of the establishment of universities in AIT5 and tax incentives for specialized research centers (Figure 7). The analyses conducted show the need for integrated redevelopment projects related to fashion and textile clusters that can expand local entrepreneurship. Investing in research and innovation would thus enable stakeholders to focus on effective large-scale synergies and a new critical mass of skills in the area.

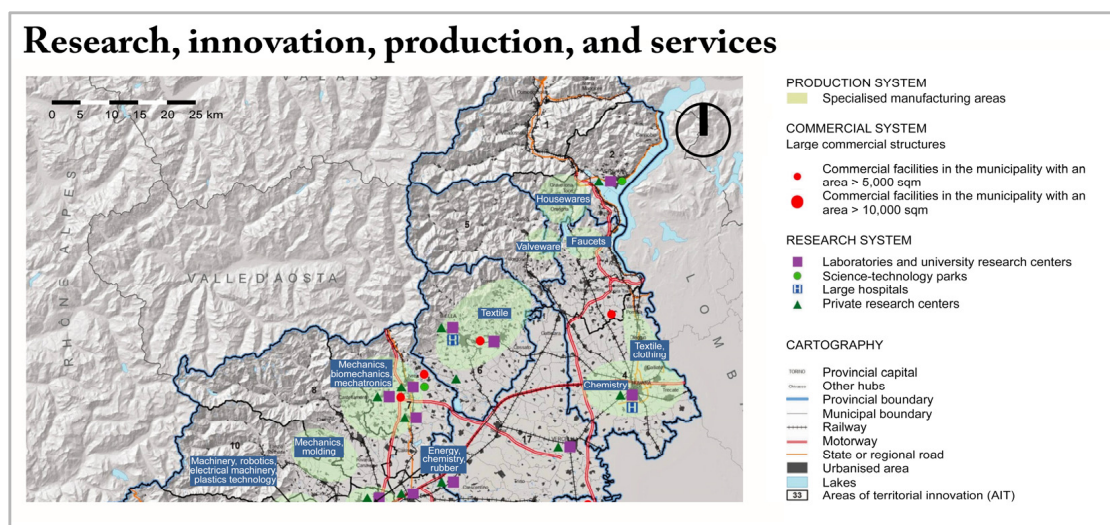


Figure 7. The investment in research, innovation, production, and services. Source: authors' elaboration based on students' reports.

4.3. The Strategic Phase

The output of the strategic phase is a strategic board for each AIT considered (Figure 8). As an example, the steps conducted on AIT5 are illustrated in the following sections.

Step 1: Sectoral/Cross-cutting themes correlation

For each AIT and directive previously identified, the correlations with the six “sectoral themes of territorial relevance” defined by the PTR are identified here.

Such correlations are of different types: (i) “belonging” identifies the priority sectoral theme related to the directive of the AIT; (ii) “positive correlation” indicates that the directive under consideration positively influences the sectoral theme, and therefore directives in different sectoral themes support each other or have a positive impact on each other (e.g., the construction/securing of a road infrastructure implies a positive impact on other tourism-oriented interventions); and (iii) “negative correlation” means that the directive under consideration negatively affects the sectoral theme, and therefore directives belonging to different sectoral themes generate operational complexity that will require negotiation among different stakeholders involved (e.g., an intervention aimed at greater protection of the forest landscape imposes the introduction of limits that will affect the primary resource of timber).

In turn, this first step of the strategic phase also analyzes the eight cross-cutting themes resulting from the exploratory phase in relation to each directive.

With reference to AIT5, the directive “Enhance infrastructural networks” previously identified was at this stage indicated as belonging to the sectoral theme “Mobility, accessibility, transport, and logistics”. A positive correlation with the sectoral theme “Tourism” is evident since this directive includes actions aimed at improving highway and rail accessibility conditions, which could give a strong boost to tourism by significantly improving the attractiveness of AIT5. In this sense, the integration of different fruitful circuits would lead to the enhancement of local peculiarities through the promotion of attractive hubs of the historical-cultural and natural-environmental type.

	Sectoral themes	Cross-cutting themes	Funding channels	Involved actors	Timeframe
	1) Enhancing the territory 2) Resources and primary production 3) Research, technology, and industrial production 4) Mobility, accessibility, transport, and logistics 5) Tourism 6) Territorial governance and cohesion	🏠 Climate change 🏡 Redevelopment and regeneration ♻️ Circular economy ⚡ Efficient energy systems 🚗 Interconnected mobility 🚒 Risk prevention 🏭 Competitiveness of the production system 💻 Digitalization	Missions and investments of the PNRR Objectives of Cohesion Policy Programming	local PAs industries and enterprises associations cooperatives emergency bodies mountain communities ...	🕒 short-term (1–3 years) 🕒 medium-term (3–5 years) 🕒 long-term (6–10 years)
Directives					
Enhance infrastructural network	<p>Belonging to 4) Mobility, accessibility, transport, and logistics</p> <p>Positive correlation with 5) Tourism</p>	🏡 Redevelopment and regeneration 🚗 Interconnected mobility	Missions and investments of the PNRR: M3C1 (investment 1.6) Objectives of the Cohesion Policy Programming: OP3	Piedmont Region, Lombardy Region, Varallo Municipality, Province of Milan, Province of Novara and RFI	🕒 🕒
Establishment of universities	<p>Belonging to 3) Research, technology, and industrial production</p> <p>Positive correlation with 5) Tourism</p> <p>Negative correlation with 6) Territorial governance and cohesion</p>	🏭 Competitiveness of the production system 💻 Digitalization	Missions and investments of the PNRR: M4C1 (investment 1.5) Objectives of the Cohesion Policy Programming: OP4	University of Eastern Piedmont and Politecnico di Torino, Zegna Baruffa Lane, Confindustria	🕒

Figure 8. The strategic board defined for AIT5. Source: authors’ elaboration based on students’ reports.

Also, the cross-cutting themes that this directive influences are “Redevelopment and regeneration” and “Interconnected mobility”. A directive involving interventions on the infrastructure network enables not only greater integration between regional/national railways and local public transport, but also the optimization of supply through integration between different mobility services. Linked to this is the possibility of regenerating the territory through the technological development of the various nodes of the infrastructure network, increasing the capacity and safety of transport, with important effects also on the type and frequency of commuter traffic.

Similarly, the directive “Establishment of universities” has been indicated at this stage as belonging to the sectoral theme of territorial relevance “Research, technology, and industrial production”, proposing actions aimed at the establishment in AIT5 of universities and research centers specialized in fashion and textile clusters.

Two key correlations are identified here. The first, positive correlation is with the sectoral theme “Tourism”, understood as the development of fair tourism, aimed at the dissemination of a recognizable image of the production and research areas. The second, negative correlation is with the sectoral theme “Territorial governance and cohesion”, since investing in training, research, and industrial production requires improving institutional capacity and strengthening collaboration between public and private entities to arrive at the definition of multilevel governance tools that support a development of the territory capable of leading to attractiveness and social welfare.

The cross-cutting themes that this directive influences are “Competitiveness of the production system” and “Digitalization”. From this directive emerges a strategic orientation to the reconversion of current production towards productions with a higher competitive and technological level, although characterized by a close link with territorial vocations. At the same time, the establishment of universities and specialized research centers calls for improved digital services, with particular reference to educational institutions.

Step 2: Funding, actors, and timing

After identifying the correlations and synergies among directive, sectoral themes, and cross-cutting themes, the second step of the strategic analysis is aimed at identifying (i) funding channels that can support the directives identified; (ii) actors that can be involved in the transformation processes; and (iii) timeframe articulation, aimed at understanding whether the proposed directives are feasible in the short, medium, or long term.

In terms of funding channels, these were sought in two major European-scale plans/policies:

- National Recovery and Resilience Plan [45], defined by the European Union following the economic and social damage caused by the COVID-19 pandemic. This financial plan is part of the Next Generation EU program [46] and is aimed at addressing the structural weaknesses of the Italian economy, accompanying the country on a path of ecological and environmental transition;
- Partnership agreement with Italy 2021–2027 [47], related to Cohesion Policy Programming, understood as the main EU investment policy aimed at identifying measures to support economic growth, job creation, business competitiveness, sustainable development, and environmental protection. Considering such programming implies coherence with the recommendations and directions undertaken at the European level, in terms of directing available funds towards a climate-neutral economy (European Green Deal, [48]) and a just and inclusive society (Social Pillar, [49]).

As for the actors, the strategic analysis focused on the study and observation of local actors for each AIT through the identification of the dynamics of the territories. Thus, in addition to international actors (such as the EU) and national actors (such as the Italian Railway Network), local actors capable of providing real operational support for the specific proposed guidelines were considered (i.e., local public administrations, industries, enterprises, associations, cooperatives, emergency management bodies, and mountain communities).

In line with the potential funding identified and the actors that may be involved in the transformation processes, implementation timelines were finally established for the proposed directives. Short-term directives were considered to be those actions requiring completion times of 1–3 years, medium-term those expected in 3–5 years, and long-term those requiring greater efforts and thus extending for 6–10 years. Based on this estimate, the directives that see a longer duration will need to be started immediately so as to be able to achieve results by the end of the funding plans.

Taking the case of AIT5, the directive “Enhance infrastructural networks” could be framed in the context of the investments provided by the National Recovery and Resilience Plan regarding rail networks (M3C1, investment 1.6, [45]). The National Recovery and Resilience Plan lays out funding for the enhancement of regional railway nodes and lines to enable the connectivity of territories by increasing the performance standards of the networks. The upgrading and rehabilitation of existing rail infrastructure and the electrification of lines are an opportunity recognized by the National Recovery and Resilience Plan to increase the efficiency of public transport and decrease travel times for passengers and freight.

Another possible funding channel is Objective 3 of Cohesion Policy Programming [47], which supports initiatives aimed at improving the nations’ infrastructure endowments. In addition to interconnection and enhancement issues, Objective 3 also emphasizes the inclusive, digital, and environmentally sustainable strengthening of transport connectivity.

In line with the objectives of this directive and the possible funding identified, the actors that should be involved in the transformation process are mainly institutional and public. Thus, regional, provincial, and local governments would play an important role, as well as the Italian Railway Network, which is responsible for managing the rail infrastructure nationwide.

Finally, since the funding needed would be substantial, the timeframe assumed is short-term for the most urgent actions to appropriately intercept the National Recovery and Resilience Plan, while it is medium-term for the ancillary actions to conclude the work by the closure of the Cohesion Policy Programming.

Similarly, the directive “Establishment of universities” could be framed in the context of the investments and funding provided by the National Recovery and Resilience Plan regarding tertiary professional training (M4C1, investment 1.5, [45]). This plan aims to enhance the offer through networking with companies, universities, and technological research centers, local authorities, and educational systems. Indeed, the education, training, and research system suffers from numerous structural and organizational problems that hinder technology transfer, so the National Recovery and Resilience Plan aims to strengthen the conditions for the development of a knowledge-intensive economy of knowledge, competitiveness, and resilience.

A further possible funding channel is Objective 4 of Cohesion Policy Programming [47], which strengthens and innovates the ordinary action of employment, education, training, and skills development policies. It also highlights the need for an increased relevance of the education and training system in relation to the work market, to intensify the dialogue with enterprises and production systems.

According to the objectives of this directive and the potential sources of funding, the actors to be involved are both public and private, such as the institutions of the University of Eastern Piedmont and the Politecnico di Torino, and also companies such as Zegna Baruffa Lane, leading in the textile sector, or Confindustria, as a professional industry association.

Finally, since the envisaged changes are structural and necessarily also involve the national level of education and training planning, the funds of the PNRR and Cohesion Policy Programming must be tapped immediately, and then directed to a series of interventions with a long-term timeframe, to progressively change the existing agreements between public and private entities.

Step 3: Identification of a strategy for the AITs

The third step of the strategic phase involves systematizing the analyses carried out in the previous phases to define an overall intervention strategy for each AIT, holding together the proposed directives to achieve common goals.

For AIT5, the proposed strategy is translated into five axes (Figure 9), namely:

- S.1: Transportation, both to connect the territory and to move to and from it in a more integrated and efficient way;
- S.2: Environment and territory, to explore the potential for the reuse, redevelopment, and protection of existing areas and biodiversity;
- S.3: Healthcare, to strengthen the network of health, welfare, and personal care services;
- S.4: Tourism and industry, both to discover new vocations for the area and to produce and share what is already present in its culture and history;
- S.5: Work and education, for the rediscovery of the area's traditions in terms of research and the dissemination of new knowledge and innovations.



Figure 9. The identified axes and statements. Source: authors' elaboration based on students' reports.

Axes 1, 2, and 5 can be regarded as priority strategies (shown in Figure 10), without the realization of which strategies 3 and 4 cannot be implemented or would lose their meaning. Consequently, axes 1, 2, and 5 are to be regarded as milestones, and should be highlighted in terms of their synergies, while axes 3 and 4 are deliverables.

The transportation axis (S.1), as an improvement of the infrastructure network, is strongly related with the environment and territory axis (S.2), focusing on the redevelopment and bringing into use of abandoned dwellings, converting them into communal, natural, or community amenity areas. Indeed, an interconnected territory improves the quality of life and services, and facilitates the response to the challenges of the territory itself and its environment. Reflecting on abandoned areas and potential conversions allows not only to deal with proposing effective connections through railway lines and motorway sections, but also to generate community areas and protect the environment. Also, the transportation axis (S.1), exploring the possibility of implementing sustainable means of transport to deal with transport issues, allows not only to intervene on the infrastructure network itself, but also on the work and education axis (S.5), by relating the fruition of spaces with the potential attractivity of promising young people in the luxury clothing and furniture industry. Such synergy would solve two major problems of the AIT: in terms of the NEET (Not in Education, Employment or Training) [43] phenomenon, and the lack of valorization of consolidated local traditions, including the production of yarns of excellence and the design of handicraft objects that are the protagonists of luxury furnishing.

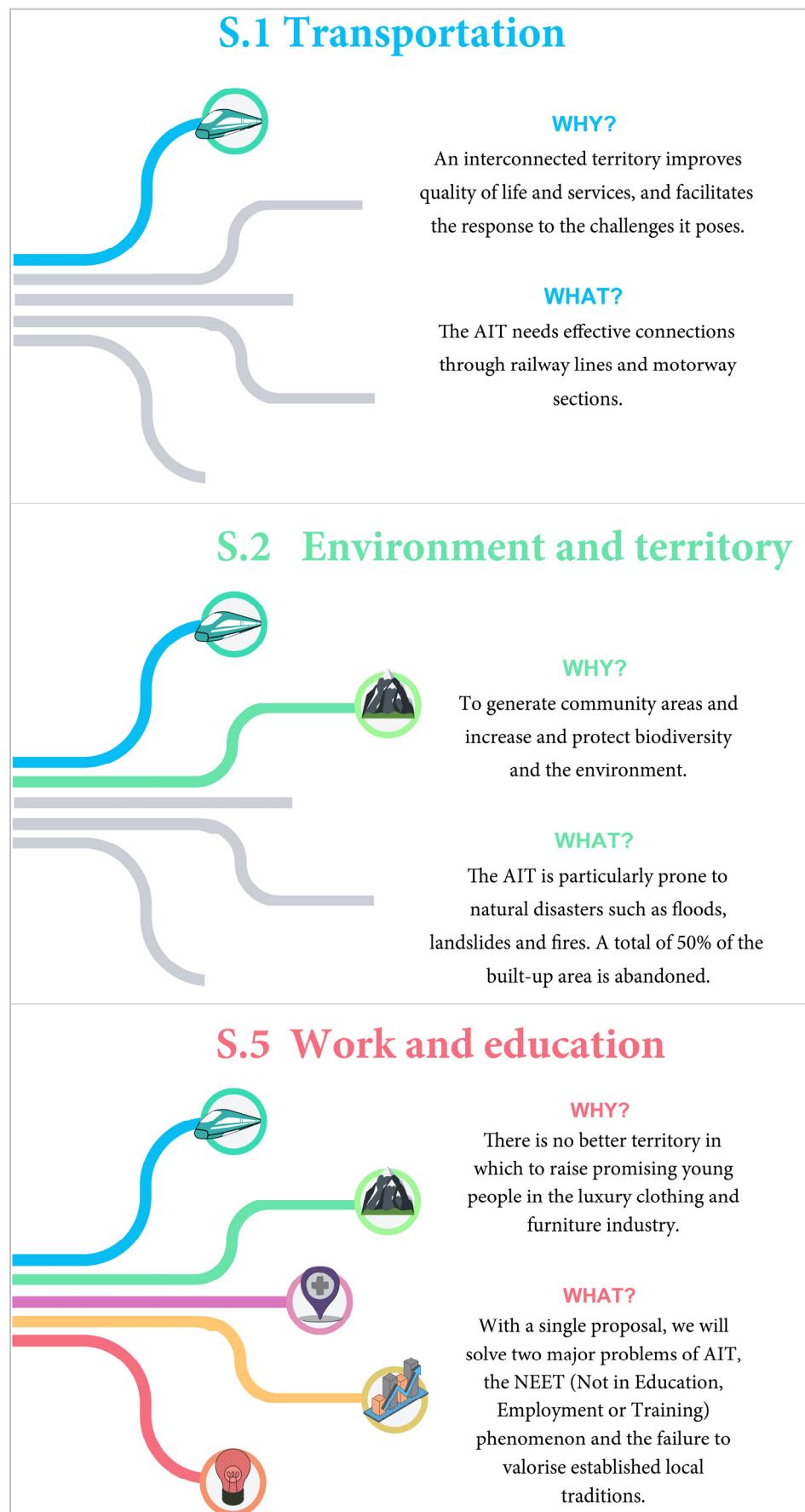


Figure 10. A focus on some priority axes for AIT5. Source: authors' elaboration based on students' reports.

Tackling such major issues would allow the possibility to work on the healthcare (S.3) and the tourism and industry (S.4) axes, as driven by and deliverables of the previous ones. For example, a coordinated and systemic reasoning on the healthcare axis (S.3) presupposes both that accessibility to healthcare is supported by an effective transport and travel system (S.1), also given the high average age in the AIT, and that spaces are identified and redeveloped in which such transformations are possible (S.2). Furthermore, a reflection in terms of the tourism and productive offer of the AIT (S.4) cannot disregard a structural intervention on the work and education sector (S.5), coordinated with the interventions on transport (S.1), in order to increase the flows of people in the territory, to generate new work and thus support local enterprises.

Step 4: SWOT Analysis

The last step of the strategic phase is to check whether the proposed strategy for each AIT meets the elements of sustainable development identified by the Regional Strategy and Strategic Macro-Areas.

To do this, a SWOT analysis [50–52] was carried out as a tool for evaluating territorial programs that can highlight strengths, weaknesses, opportunities, and threats of the choices made. Strengths and weaknesses are endogenous factors, closely related to the territorial area or project under consideration. Therefore, they are certain and expected in a short time and can be changed directly by the proposed project. On the other hand, opportunities and threats are exogenous factors and arise from the external context. In this sense, they are random and difficult to change but must be identified and kept under control to take advantage of opportunities and reduce threats.

Figure 11 shows the SWOT analysis carried out on the proposed AIT5 strategy.



Figure 11. The SWOT analysis conducted on the strategy for AIT5. Source: authors' elaboration based on students' reports.

The SWOT analysis shows how the proposed strategy for AIT5 has many positive elements (strengths and opportunities) but is also potentially subject to issues (weaknesses and threats).

The strategy for AIT5 has a strong bias toward the transportation axis (S.1) in terms of the activation of the rail network and the implementation of the highway network linked to the further development of land regeneration and redevelopment policies. This focus emerges in the SWOT analysis as “efficient connections” and “extent of accessibility to health services” but also as opportunities for “increased flows of people and goods”, “decreased pollution”, and “creation of universities/research centers”, supported by the existence of efficient transportation. The proposed transportation strategy would bring direct benefits due to improved connections and reduced pollutant emissions, with spillover effects on residents’ quality of life. This is particularly evident if considering the connection with health services located outside AIT5, which is highly underdeveloped from a healthcare perspective (S.3). At the same time, there would be numerous indirect benefits, as the improvement of transport would act as a driver for the creation of a university and research hub (S.5) and, at the same time, could lead to the enhancement of established local traditions by implementing tourism of excellence (S.4).

Potential weaknesses and threats identified in the SWOT analysis consist of “land consumption and landscape defacement” and “increase in road traffic”, especially with reference to the highway network, which should be built *ex novo* and could become heavily used following the implementation of all the axes of intervention proposed by the strategy.

These actions related to transport implementation are in line with the Macro-Area “2.C: Promote and facilitate the conversion in a more sustainable transport and mobility”, which emphasizes the need to strengthen infrastructures, in terms of enhancing mobility to support development and reduce the negative effects that impact the territory, and designing a transport system that responds adequately to new needs. Also, with regard to Macro-Area “7.C: Develop an integrated and multi-specialist approach and interaction between hospital and territorial structures”, the strategy for AIT5 highlights the need to rationalize regional health with a reconfiguration in the territorial network. Such a sustainable development strategy contextualizes local activities in a global perspective, since the ability to manage infrastructures to compensate for uneven territorial disparities is particularly important to design and plan local actions carefully.

The proposed strategy for AIT5 also includes a focus on environment and territory (S.2), with the proposed redevelopment of existing areas and buildings currently in disuse. This aspect of the strategy would allow the implementation of elements defined in the SWOT analysis as “avoidance of land consumption”, “creation of student housing”, and “implementation of healthcare services”. The reuse of existing real estate would allow the AIT to contain the economic and environmental impact caused by the construction of new buildings as well as the reception of potential students in the prospect of creating university and research centers in the AIT (S.5). A further important strength is the possibility of implementing health services (S.3): in the absence of a suitable hospital, the redevelopment of existing properties could enable the establishment of efficient diagnostic and treatment centers, whether private or public. This aspect inevitably highlights the need for medical personnel on AIT5 which could be a weakness of the strategy.

On the contrary, the spillover effects that this axis could have on the AIT from the point of view of tourism (S.3) are risky. Accordingly, the SWOT analysis identifies two possible threats: (i) a mismatch between tourism demand and accommodation supply, understood as the possibility that buildings will be redeveloped in the face of a derisory increase in tourism and that therefore the AIT will end up with a slice of redeveloped but unused real estate; and (ii) the congestion of valleys, caused, on the contrary, by a high flow of people entering the AIT that risks undermining the quiet resort nature of this territory.

These aspects highlight a multifaceted approach to sustainable development and are in line with the Macro-Area “3.C: Enhance and promote the cultural and environmental heritage”, which emphasizes how the environment and territory of the region, if wisely valorized, can contribute to the development of the regional territory and to the creation of inclusive, safe, secure, resilient, and sustainable cities and territories. Also, the Macro-Area “2.A: Promoting energy efficiency measures” highlights the need for coordinating

planning tools with the objectives of land use saving and emission control, through the re-functioning or replacement of parts of cities, in which to pursue high standards of energy-environmental sustainability. Such a reflection relates to private, public, and healthcare buildings characterized by a high primary energy consumption and structural problems that make efficiency measures complex.

The last main axis of the strategy for AIT5 consists of directives aimed at improving the employment and educational situation in the area (S.5). The SWOT analysis shows strengths and opportunities such as “increase in jobs”, “decrease in brain drain”, “creation of a university and research hub”, and “enhancement of local excellence”. This aspect of the strategy, in synergy with S.1 and S.2, presents clear socio-economic opportunities at different scales: from the local scale through the creation of jobs in the area, to the regional scale through the creation of a university and research hub, to the supranational scale through the decrease in brain drain.

Despite the obvious advantages, the SWOT analysis also highlights weaknesses and threats that must be taken into consideration. In addition to those already mentioned on the previous axes, AIT5 should question the need to implement school and research staff, especially with a view to providing a university location. Such a strategy should therefore be developed at an appropriate territorial scale, in an approach of partnership and coordination among sectors and actors.

Again, the need to consider different scales, actors, and flows is in line with the Macro-Area “1.A: Developing economic forces/businesses of sustainability”, related to the intended focus on strengthening the research system to make the territory attractive to talent and businesses, and encouraging the transition to more sustainable production through research and the dissemination of innovative processes. Also, the idea to locate universities and research centers in the area is aligned to improve the productivity of an increasingly complex and competitive economic system, but especially as sources of creative energies for the search for sustainable growth solutions, highlighted in the Macro-Area “4.D: Implementing the transversality of culture to increase the competitiveness of the regional business system”. These considerations result in a clearer perspective on enhancing local resources and existing vocations, in a socially and economically sustainable manner.

5. Conclusions

This paper explores the crucial role that the regional level plays in the place-based territorialization of sustainable spatial development strategies and objectives defined at the international and EU levels. In so doing, it positions itself within a fertile branch of the literature concerning the crucial role that the regional scale may play within the overall EU multilevel governance framework [4,10,11]. In particular, the authors illustrate and discuss a collaborative methodology that was adopted to inform the Piedmont Region’s PTR revision process, implemented in collaboration with regional officials and a multidisciplinary task force of high-profile students. The application of the proposed methodology led to the development of complex intervention strategies for the 33 AITs identified by the PTR, by integrating supranational strategic objectives and funding streams with regional spatial development priorities, in order to reflect on the development vocations of the selected AITs, and to tailor upon the latter concrete and operationalizable integrated local development strategies that position themselves in coherence with both supranational objectives and multilevel funding streams³.

This methodology stands as a possible way to concretely practice multilevel governance: as already argued by various authors [4,54–56], the regional level potentially represents the ideal catalyst of the Italian system, a virtuous hinge between the strategic objectives and funding priorities defined at the supranational and national level and the spatial planning prescriptions produced by the lower levels. In the Piedmont Region, the nature and scope of the PTR allows for the integration and territorialization of various types of superordinate development strategies. This has been tested in the discussed experience in relation to the 2030 Agenda framework, leading to an attempt to integrate broader sus-

tainable development objectives within the more concrete territorial development strategies proposed for a sample of the AITs composing the regional territory.

The adopted methodological framework included a detailed study of the current PTR and of the Regional Strategy, an understanding of the current positioning of each AIT with respect to the specific objectives and directions of the PTR, and the development of an intervention strategy from a sustainable development perspective. Through a preliminary exploration and a two-phase structure (analytical and strategic), the research firstly provided a picture of the main characteristics and peculiar aspects of each AIT through the use of qualitative and quantitative indicators, and better located a potential sustainable intervention strategy through the identification of the relevant aspects of the Regional Strategy for SD to be considered. Secondly, it proposed complex policy and intervention packages to guide the future territorial development of each AIT and a set of guidelines defining priority issues for their development.

From this perspective, the role of the proposed methodology is twofold. On the one hand, it provides an up-to-date picture of the potential directions that the specific PTR of the Piedmont Region could take, in relation to important sustainable development principles. On the other hand, it proposes an articulated process to experiment and practice multilevel governance through a gradual analytical and strategic framework, potentially replicable in a different context, and further adaptable and perfectible according to the specific structure of PTRs in other regions. In this sense, it represents a first attempt to integrate supranational strategies and objectives within a regional territorial context, which can be useful to politicians and decision-makers involved in regional development, bearing in mind the crucial need to make cities and territories more sustainable through concrete, localized and effective actions.

Future developments of the work envisage a concrete shift from strategies to actions for the transformation of the Piedmont Region's AITs in terms of projects to be built together with institutional and non-institutional actors, to make the most of the funding opportunities currently available.

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Notes

- ¹ As highlighted by the results of the ESPON COMPASS project [6], this is particularly true in those countries that, due to territorial and historical reasons, are characterized by a regionalized or federal administrative structure, which features a rather independent array of regional administrative levels whose governments are directly elected by the citizens.
- ² Despite its general non-prescriptive nature, the PTR is legally binding for the sub-regional levels, that are required to produce their spatial planning instruments coherently. Due to the proliferation of regional spatial planning laws starting from the 1970s, Regional Territorial Plans are nowadays different in form, functions, procedures, and even denominations, even if most of them retain the 'hinge' function discussed in this contribution.
- ³ The adoption of similar approaches, dedicated to the identification of supralocal areas as meaningful catalysts of multilevel governance, is becoming more and more common in the Italian context, for instance, through the action of the National Strategy for Inner Areas [53].

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