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Productive Archipelagos for an Alpine Urbanity

Luca Zecchin

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Mountain Productive Landscapes in the Socio-Ecological Transition

Paesaggi Montani della Produzione nella Transizione Socio-Ecologica

Marcello Modica and Anna Karla De Almeida Milani (dir.)

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TABLE OF CONTENTS

Productive Archipelagos for an Alpine Urbanity

Luca Zecchin

Introduction

1 This article addresses the project-related challenges of scattered industrial areas within alpine urbanities. The phenomenon of the diffusion of productive settlements in the Alps is examined through a case study in Trentino, based on the research "Aree e sistemi produttivi della Comunità Alta Valsugana e Bersntol. Linee guida per aree paesaggisticamente ed ecologicamente attrezzate[1]", which employs the tools of architecture—and its project for the landscape—as both an interpretative and operational framework.

2 Studies on the alpine mountain have traditionally focused on its extremes, with high-altitude areas defined through imaginaries aligned with tourism models. This perspective tends to obscure the intermediate altitudinal zones, corresponding to low- and mid-mountain areas (Zecchin, 2012) between 600 and 1,500 meters. These are the so-called "middle mountains" (Varotto, 2020), composed of heterogeneous territories, discordant landscapes, and dispersed urbanities, distinct from high-altitude areas and valley-floor settlement systems. The organization along slopes and valleys, the presence of a network of small settlements, and the historically characteristic use of local resources structure these lands as a transitional space, where settlement complexity can be interpreted through the categories of the dispersed city (Secchi, 2005), in which urban and productive fragments coexist with "natural" landscapes in polycentric forms.

3 The European Alps represent a privileged observatory of this condition, which suffers from the fragility of an autonomous identity, reproducing development models derived from other contexts. By integrating into global exchange dynamics, the Alps continue to function as providers of natural resources, ecosystem services, and intangible goods such as landscape and recreational opportunities for metropolitan populations, while also constituting a complex fabric of dispersed urbanities that reflect development

processes similar to those of the lowlands. Demographic and commuting data in the Alps indicate that urbanization processes have reached levels comparable to those of non-alpine areas (Bätzing, 2005). Employment data show that expanding economic sectors evolve according to their own dynamics, different from those of peri-alpine conurbations, and highlight the progressive establishment of the alpine space as a recreational and residential area for second homes (Perlik *et al.*, 2001).

4 The trend toward the mono-functional reduction of alpine territories is evident. Alongside the consolidation of certain privileged destinations for mobile capital investment—often detached from the needs of local communities or the specificities of local economies—many areas remain relegated to complementary functions, hosting less desired activities outside the consolidated imaginaries, and integrating into the dispersed system of the "landscape-city" (Corboz, 1983; Bocchi, 2010) as marginal productive and infrastructural elements. These areas play a key role in the increasing separation between production spaces and landscapes destined for tourist consumption.

5 An exclusive focus on aesthetic or landscape values, or on an idealized notion of alpine rurality, does not automatically imply sustainable development, which appears rather as a strongly relational phenomenon (De Rossi, 2018).

6 The resulting reality oscillates between two extremes: one associated with tourism-driven development and the other marginal, located outside established mass circuits, yet where urbanization processes are still ongoing. Across large portions of valley floors and secondary valley slopes, the landscape appears eroded by reductions and fragments of urbanity alien to the local context. Investigating this phenomenon requires moving beyond geographic determinism, which links the Alps to the romanticized image of an ecological and tourist oasis (Bonomi, 2013), in order to reveal a more complex reality. Alpine urbanization, also observed comparatively with other mountain contexts and with urban forms in the lowlands, continues to expand under the influence of structural economic changes and post-Fordist production models (Perlik, 2022), configuring new interactions between production and landscape.

7 In this transitional space of dispersed urbanity, the visible and invisible traces of qualitative marginality continue to accumulate (Zecchin, 2012), linked to the ongoing modernization of the alpine mountain. Among these, forms of industrialization play a significant role. The scattered construction of industrial sheds and small- to medium-sized craft and commercial areas has its roots in the economic boom of the 1960s and 1970s, when rural, including mountain, areas were identified as crucial for industrial development, supported by specific public incentives, the availability of low-cost land, and proximity to strategic resources and infrastructure, thus initiating forms of urbanization in dispersed urban fragments. Between the 1980s and 1990s, industrial relocation and the expansion of small and medium-sized enterprises further intensified this phenomenon.

8 The consequences are manifold. Economically, this development has promoted employment, attracted investment, and increased the productive competitiveness of certain territories. Environmentally, it has contributed to landscape fragmentation, altered ecological balances, and increased various risks, including hydrogeological hazards. Socially and culturally, it has generated significant demographic changes, modifying the identity of places. What emerges is a form of urban governance characterized by tolerance, linked to modernization processes and widespread across

much of the Italian territory. This practice, based on the "cultivation" of agricultural areas through construction, has produced a certain increase in wealth and living standards but has left a legacy of indiscriminate land sealing, settlements in flood-prone and hazardous areas, limited multifunctionality in land use, the erasure of historical settlement structures, and a decline in environmental and landscape quality (Mercalli & Sasso, 2004).

9 This is the so-called "alpine peri-urban" (Diener *et al.*, 2005; Bertrand & Vanpeene Bruhier, 2007), formed through the juxtaposition of buildings, industrial sheds, scattered villas, and houses on plots often of low construction quality and lacking contextually informed formal design. The resulting disorderly mix integrates elements of the dispersed city, with a progressive return of woodland, traditional agricultural enclaves, and small agritourism structures connected to global networks (Corrado, 2016), producing a hybrid, highly interrupted, and potentially relational landscape. The territorial policies adopted have relied on a fragmented and welfare-oriented approach, addressing issues in a sectoral and disjointed manner. This has resulted in land management based on the separation of uses rather than their integration, favoring certain activities over others (Mercalli & Sasso, 2004).

Objectives

10 The objectives of the research on the productive areas and systems of the Comunità Alta Valsugana e Bersntol in Trentino are twofold. On one hand, they focus on constructing a general knowledge framework and on conducting a quantitative and qualitative analysis of the productive areas present in the territory. On the other hand, they aim to formulate project guidelines oriented toward the transition of settlements into "Aree Paesaggisticamente ed Ecologicamente Attrezzate" (APPEA, Italian acronym for Landscape and Ecologically Equipped Industrial Areas). Based on several project-based experiments in morphological rewriting, aimed at configuring the relationships between settlements and the open or built spaces of the mountain, the guidelines establish criteria and directions to support processes of sustainable urban regeneration of existing areas, as well as potential future needs for expansion or new locations.

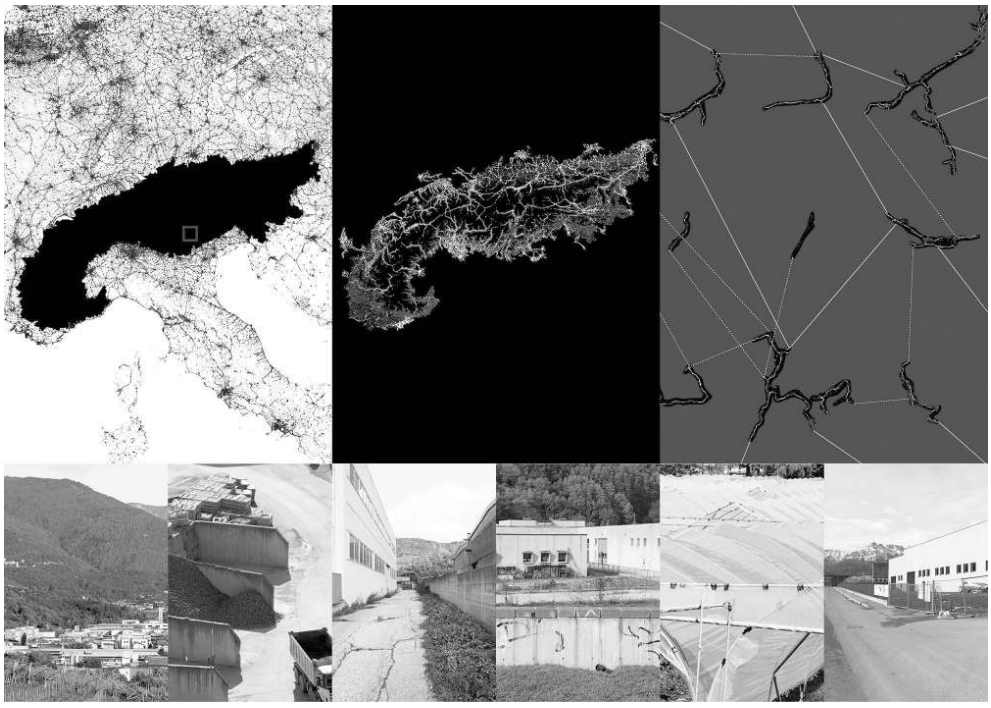
11 Industrial production appears not to be part of the contemporary alpine imaginary (Diener *et al.*, 2005; Zecchin, 2017; Modica, 2022), yet it constitutes one of its foundational elements, a territorial construction stratified over time. In the mountain "urban countrysides" (Samonà, 1968), economic activities, initially based on agricultural production, intertwine with non-agricultural activities introduced through modernization, generating a complex and difficult-to-interpret system. Industrial geography reveals the density of settlements, their spatial distribution, and their relationships with orography, railway, road, and river infrastructures, biodiversity areas, and environmental criticalities (Zecchin, 2017). Although the intensity of industrial production cannot be compared to that of metropolitan lowland areas, the incidence of industry in the Alps assumes significant relevance given the limited availability of flat land (Modica, 2022), shaping a phenomenon of alpine dispersed urbanity which, though fragmented, structures the territory according to productive and infrastructural logics.

12 Forms of pervasive industrialization are distributed along the edges of historic settlements and more recent developments in low- and mid-mountain areas. This

phenomenon results from the intersection of local dynamics, characterized by strong parochialism, and the influence of functionalism in spatial planning (Secchi, 2000). Industrial areas take the form of fragmented surfaces of varying extent, occupied by large-volume buildings, predominantly sheds intended for productive or artisanal activities. The environmental degradation and the low architectural and urban quality of these areas stem from standardized project approaches, often lacking sensitivity to contextual specificities, which produce opaque, identity-less spaces and call for a critical project-based rethinking (Zecchin, 2017). This condition is further exacerbated by the shortage of services and hierarchized infrastructures, as well as by the proliferation of "non-places" (Augé, 1992), disconnected from surrounding urban and "natural" fabrics. Exploring this intermittent condition implies a project articulated in parts, operating between different "natures", capable of enabling the coexistence of production and environments according to the forms of the "landscape-city" (Zecchin, 2019).

13 Low-technology, spatially simple urban materials of a productive-industrial nature characterize vast portions of the alpine landscape (Figure 1). These constitute "*mikrokosmos*" (Zecchin, 2017), that is, industrial sheds and productive fabrics, dispersed fragments, and plates of varying extent of industrial areas. Due to their diffusion and fragmentation, such settlements appear as discontinuous and heterogeneous resources, spaces to be recomposed through project-based approaches that enhance their functionality, reduce conflicts with the environment, and promote their integration into the morphological framework of the landscape. Addressing their incompatibility with the complex orographic context, improving environmental and energy resilience, increasing social inclusivity and patterns of use, and transforming these spaces into productive systems oriented toward the generation of new ecologies define the new approaches to be explored through the project.

Figure 1. Productive-industrial urban materials in the alpine landscape



L. Zecchin.

14 The territorial case study of the Comunità Alta Valsugana e Bersntol is paradigmatic of a secondary valley system—located east of Trento along the upper section of the Valsugana—where industrial areas are inserted into a settlement pattern typical of alpine dispersed urbanity. Continuous land consumption is accompanied by a substantial typological uniformity, with the prefabricated shed as the dominant element, whose density is primarily regulated by regulations concerning distances from road boundaries and between buildings within plots. The particular orographic condition, in the absence of a continuous integration between urban areas and the interspersed open spaces, in a territory rich in environmental assets and with a high level of infrastructure, produces recurring characteristics. Initially, the transition from an essentially agricultural production system to an industrial-artisanal economy affected specific nodes. The main productive development occurred through large productive plates, while the original agricultural activities were converted to support tourism. Over time, the spread of small- and medium-sized productive areas dispersed across the territory, resulting in a disarticulated pattern differentiated by sectors specialized within local micro-contexts.

15 In Trentino, the urbanization of the countryside began in the 1960s, in the "expanding cities" (Samonà, 1976) of the "Comprensori"—today the "Comunità di Valle"—as a response to the need to restore meaning to settlement in valleys characterized by severe fragility and significant emigration flows. The 1967 "Piano Urbanistico Provinciale" (PUP) by Giuseppe Samonà (Samonà, 1968) outlined an ambitious project. Its design envisioned a territory rethought in terms of values and infrastructural organization, the provision of spaces for industrial production, and social facilities, revealing intentions to protect environmental and landscape values and to use these resources innovatively as a basis for tourism development prospects and as a safeguard of local identity. These actions were framed within a modernization hypothesis conceived as a response to the recognized loss of settlement meaning across large portions of the territory, particularly with regard to traditional agricultural areas and marginal settlements. Industrialization was seen as an alternative to valley depopulation and as a pivotal strategy for reconstructing vital territorial relationships.

16 This idea of the equipped "urban countryside," conceived as a "city in a garden" (Viganò, 2015) and conceptually inverted, can be identified and renewed in other forms. An "urban countryside" is a constructed, productive, and "in function" space, reshaped over time. Industrial areas are part of this valuable infrastructure, a construction with characteristics and potentialities that call for project-based intervention.

Methodology

17 The objectives of the research and the project for the productive areas and systems of Alta Valsugana and Bersntol are addressed through a methodological approach articulated in three phases. The first phase is dedicated to constructing the knowledge framework, aimed at understanding and describing the current state of the territorial productive system. This includes the analysis of secondary-sector productive areas of the provincial level and of productive and/or mixed areas of the local level, in order to outline a detailed overview of existing provisions and to guide subsequent strategic decisions at both territorial and local scales. This phase relies on fieldwork, including

site inspections and photographic surveys, as well as on a systematic study of territorial data collected by the "Servizio Statistica della Provincia Autonoma di Trento" and the "Servizio di Pianificazione Urbanistica della Comunità di Valle Alta Valsugana e Bersntol" (2015–2020). The second phase delivers the project plan for productive areas and systems, through verification of the boundaries of secondary-sector productive areas of the provincial level, identification of strategic productive areas for territorial development, definition of guidelines for local productive areas, and the identification of priority areas for redevelopment. The aim is to achieve a coherent morphological and landscape arrangement, limit processes of dispersed urbanization, and contain soil consumption. The third phase formulates the guidelines for the "Aree Paesaggisticamente ed Ecologicamente Attrezzate" (APPEA), supporting the planning, design, and management of sustainable productive contexts with high environmental, urban, landscape, and architectural quality, both in relation to processes of existing area regeneration and to potential new developments. The project-based approach—with potential applicability in other territorial contexts with similar characteristics—aims to establish a dialogue between industrial areas and the dispersed alpine landscape, reinterpreting this type of "landscape-city" as a network of productive, ecological, and urban fragment-places.

18 The investigated case study represents a sampling area of approximately 20×30 kilometers, encompassing diverse fragments, areas, and buildings, as well as residual or discarded spaces. This sampling allows for an examination of "territorial anisotropy" (Zecchin, 2017)—a fundamentally non-uniform territory in which orographic, morphological, infrastructural, and environmental conditions vary differently, producing heterogeneous spatial behaviors—related to the specific orographic context, and enables the identification of the latent design embedded within industrial fragments to be reoriented.

19 The study of real phenomena and spaces highlights critical issues, while field surveys identify productive relationships. The resulting maps document the elements encountered, record the distribution of urban materials, and relate them to other parts and their ecologies.

20 The analysis of environmental components interacting with industrial production areas aims at a quantitative and qualitative understanding of these interactions, and its spatial representation seeks to depict their territorial distribution, conflicts with geographic factors, the location of activities exerting pressures on the environment, and the distribution of sensitive elements. These constraints delineate opportunities for designing productive landscapes coherent with the morphology of the alpine "landscape-city", enhancing fragments and connections between recomposed places.

21 The guidelines—a sort of manual, a meta-projectual framework for the implementation of ecological and landscape facilities in industrial production areas—organize the elements and logics of the project most appropriate to the context. The directives promote sustainable urban regeneration through the redevelopment of existing industrial areas, with the aim of connecting them to the landscape, as well as to relevant environmental and architectural elements, through strategies of integration and ecological mitigation that enhance relationships with other mountain spaces. The landscape component becomes the core of the project, fostering the renewal of settlement systems, the redesign of edges, and the use of blue-green infrastructure (Zecchin, 2019)—integrated networks of natural and semi-natural elements designed to

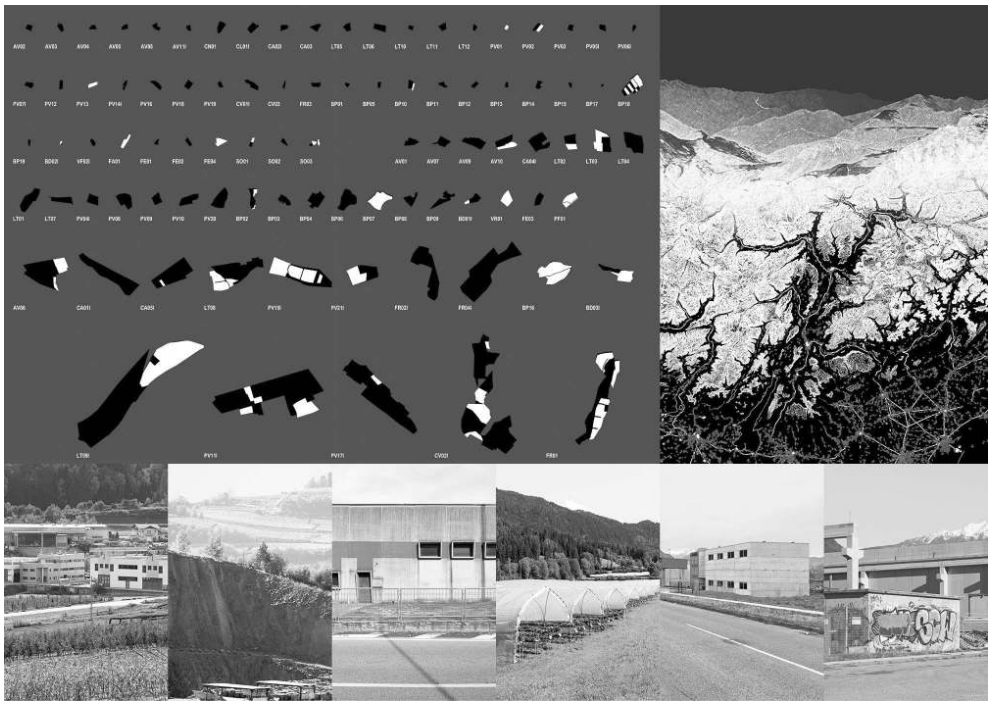
manage water resources, preserve biodiversity, and improve environmental quality in urban and territorial contexts (European Commission, 2013)—as structural elements integrated into the dispersed alpine context. The underlying idea of the plan project is to propose industrial productive areas as parts of an "archipelago," strengthening their margins and thresholds, enabling interaction with ecological networks, and introducing vegetation elements, connections, and multifunctional micro-facilities, while preserving open spaces as environmental resources and constructing an ecological matrix of interconnected productive places.

22 Within this matrix, the research focuses on project verification in the pilot areas. These are the fragments identified as strategic in terms of size and location: industrial and artisanal productive areas, often contiguous with commercial or peripheral urban zones; specialized functional areas, landfills, or waste collection centers; larger fragments characterized by decommissioned or low-output extractive activities; rural plots of protected agricultural crops or industrial-scale greenhouses. This availability of heterogeneous parts represents a resource for the project, providing opportunities for compositional combinations capable of generating landscape.

Results

23 In the valley system under study—the territory of Alta Valsugana and Bersntol in Trentino—productive areas occupy a surface of 1,884,480 square meters, of which approximately 30% are undeveloped spaces (Figure 2). This phenomenon, common to other alpine contexts, concerns the concentration of industrial areas in valley floors characterized by the presence of significant infrastructure and services, the decline of existing industrial areas in marginal mountain municipalities, and the coexistence of industrial production with agricultural or agritourism activities. Particular attention is given to the management of so-called productive "voids" (Zecchin, 2017), that is, planned but not yet realized areas, which represent opportunities for an integrated reconfiguration of the "landscape-city." Recent economic crises have led to a proliferation of unsold industrial sheds and a general underutilization of planned areas. Added to this is the urgency for policies aimed at rationalizing settlements, in line with ongoing tertiarization, and interventions for landscape, environmental, and functional recomposition (Modica, 2022).

Figure 2. Production areas in the territory of Alta Valsugana and Bersntol, Trentino



L. Zecchin.

24 Field surveys identify "*junkspaces*" (Koolhaas, 2006), waste spaces rich in potential, yet unattractive and indifferent. These spaces differ markedly from the picturesque environments to which the alpine imaginary is accustomed, being characterized by the juxtaposition of rudimentarily designed objects. Recognized as "*drosscapes*" (Berger, 2006), whether current or potential future ones, these fragments of urbanity are exposed to hydrogeological hazards and air pollution.

25 Analysis of territorial databases (Servizio Statistica della Provincia Autonoma di Trento; Servizio di Pianificazione Urbanistica della Comunità di Valle Alta Valsugana e Bersntol, 2015-2020) indicates that, in the studied territory, climate change has resulted in a significant increase in seasonal temperatures, particularly in summer (+5°C). Precipitation patterns show more complex variations: a marginal annual increase (+2–3%), accompanied by significant decreases in summer and winter (-6–9%) and increases in autumn (+7–15%). Industrial production areas border approximately 4,800 linear kilometers of watercourses. The qualitative condition of these watercourses reveals a lack of environments in high ecological status, widespread river sections where good ecological condition is unstable, and a particular prevalence of watercourses in insufficient ecological status. The widespread presence of springs and areas of concern due to intensive groundwater exploitation interferes with the main productive areas. Environmental degradation is exacerbated by the morphological alteration of watercourses, the reduction of vegetated buffer strips, and conflicts between productive infrastructures and water flows, indicating the need to design ecologically equipped interventions as mitigation and resilience infrastructures. In terms of land use, the studied territory is predominantly occupied by forests (32.4%) and agricultural areas (18.6%). Urban areas account for 22.4%, reaching peaks of around 50% in valley floors. The potential new land consumption amounts to approximately one million square meters, due to the presence of planned industrial areas, residential

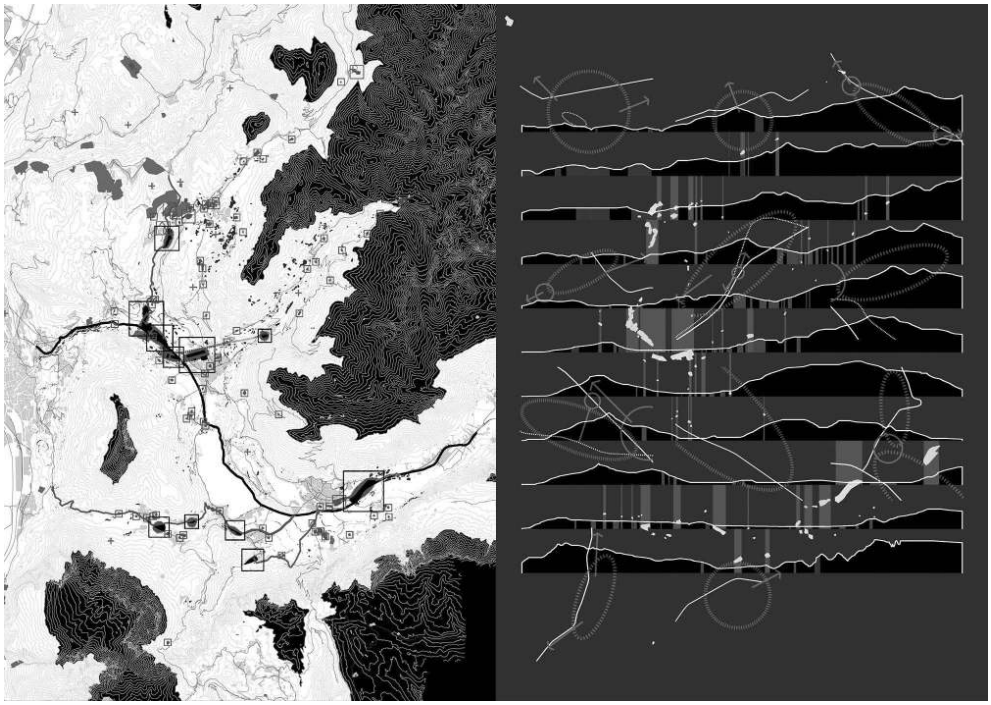
areas (671,634 m²), and expanding urban zones (387,741 m²), in conflict with approximately 28% of the total vacant and unused housing stock. Areas subject to reclamation, landfills, inert material processing zones, and porphyry and gravel quarries represent spaces that are still little considered, yet remain contiguous with productive areas. Extractive activities occupy 3,572,328 m², with a potential reserve of 40,250,000 m². Crises in the construction sector have led to the abandonment of lots and quarry sites, resulting in unemployment. Approximately 19,000 hectares of forest are classified as production forest, and widespread phenomena of abandonment and spontaneous reforestation reflect changing socioeconomic conditions. The interface between industrial production and agricultural areas extends for approximately 170,056 linear meters, with trends toward fruit specialization and protected greenhouse cultivation. The fragmentation of rural soils, the abandonment of marginal plots, and their transformation into industrial greenhouses (1,812,030 m², 52,000 m) constitute critical elements, which are addressed in the project as opportunities to integrate productive, agricultural, and forestry activities into a coherent and multifunctional system.

26 The guidelines outline the strategic themes for the ecological and landscape-oriented regeneration of existing areas and for the planning of new extensions. The thematic framework—developed in parallel with field research and continuously informed by the interpretative analysis of data—is structured around seven strategic issues: logistics, concerning transport and mobility systems; settlement, referring to the urban and territorial structure; landscape integration, addressing edge conditions and spatial insertion within the landscape; architectural quality, related to the built environment and the identity of places; open-space quality, connected to systems of porosity and blue-green infrastructure; environmental sustainability, referring to risk management, soil and subsoil, energy, noise, and waste; and governance, understood as the integrated management framework of the industrial area.

27 The guidelines therefore define objectives, materials, and project rules aimed at guiding and supporting future plans and local interventions within productive areas. They are conceived as flexible tools, capable of adapting to different scales and to the varying levels of settlement complexity present in the studied territory or in similar contexts. Based on the specific settlement and production structure, the objectives, materials, and project rules are applied to three types of areas (Figure 3): “major plates”, that is, existing larger hub areas with locational and logistical connectivity characteristics sufficient to play a strategic role for the entire provincial territory, with an aggregated areal nature; “minor plates”, existing or planned areas smaller than the major plates, with intermediate locational and logistical connectivity, more locally oriented, with an aggregated areal or point-based character; and “fragments”, small-scale existing or planned areas, isolated and/or internal to consolidated urban fabrics, with a mononuclear point-based character. An applicative matrix of the guidelines is organized according to the different types of areas and their respective levels of implementation priority. Artificial soils are to be transformed into multifunctional soils, with topographies suitable for phytoremediation, water storage, and drainage. Central to this process are operations for remodulating densities and applying morphological and settlement rules aimed at constructing coherent edges, preserving central voids as green reserves, and providing thick ecological margins, thereby ensuring high ecological quality and provision. Ecologically oriented infrastructure integrates urban planning with the preservation and generation of ecological

functions, mitigating risks associated with climatic and hydraulic changes through a network of concatenated voids and the use of "*preverdissement*" preventive planting strategies. Additional measures include architectural reuse through recycling of existing structures, flexible spatial organization, the introduction of new functional "*mixités*", the creation of inhabitable green roofs, the recomposition of high-performance building envelopes, increased energy production from renewable sources, selective densification, insertion of new architectural volumes to consolidate discontinuous fronts, and selective thinning of areas to be renaturalized or returned to agriculture. Productive spaces can be internally reorganized, with scenarios for coexistence between companies, incubators, and technology districts that share facilities and services, integrating vegetative and architectural elements at multiple scales, from vertical greening to the renaturalization of built structures.

Figure 3. Settlement structure of production areas: major plates, minor plates and fragments



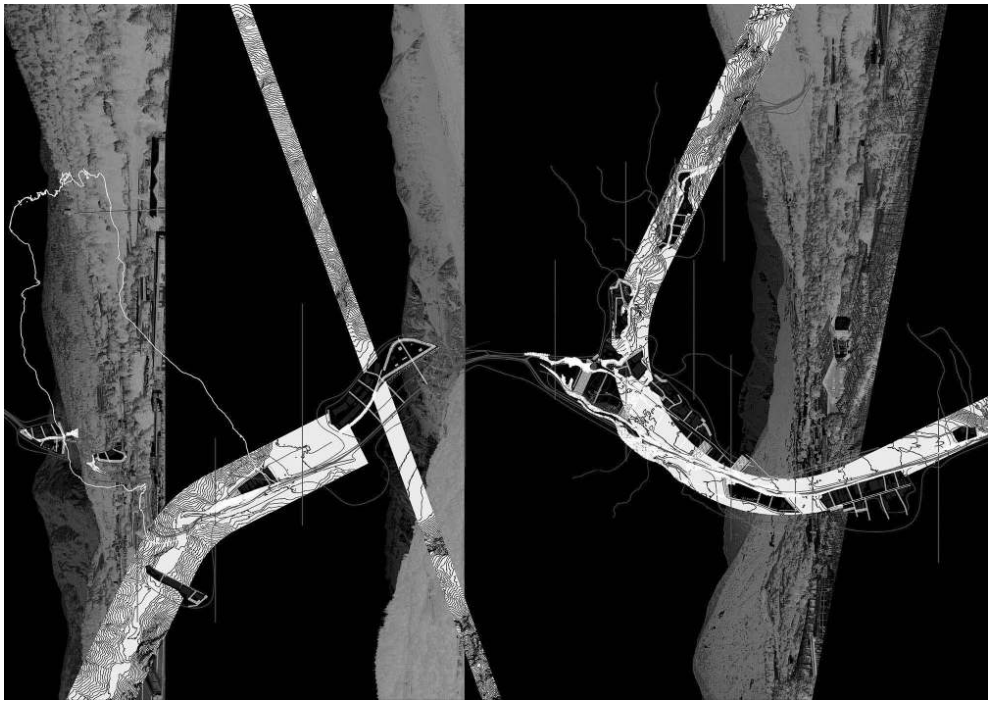
L. Zecchin.

28 This involves structuring a project over time, a form of repair that will restore the territory with higher quality. To narrate this transition, it is important to start from a new conceptual image: the "*mikrokosmos*" (Zecchin, 2017) as a productive figure, useful for interpreting a landscape designed in reconnectable parts—like the islands of an archipelago—whether these parts produce goods, porphyry, gravel, timber, vegetables, or other outputs, constituting a constellation of productive places in harmony with the topographic mantle that unites them.

29 Reconsidering the idea of the urbanized countryside as a productive space, industrial areas can be reintegrated with other equally productive spaces, such as agricultural land and forests. In these locations—which can also be considered gardens, with a relatively small scale—a pervasive quality may emerge, where biodiversity permeates the built and infrastructured environment, creating a composed mixture of heterogeneous "natures". The proposed territorial strategy reconsiders industrial

production areas as active places, parts that interact with ecological networks, bordering or crossing them. The image of the "analogous *mikrokosmos*" corresponds to the assembly of sequences of industrial production areas along water networks and the valley's topographic system (Figure 4).

Figure 4. Analogous *mikrokosmos*: assembly of industrial production area sequences along water networks and the valley topographic system



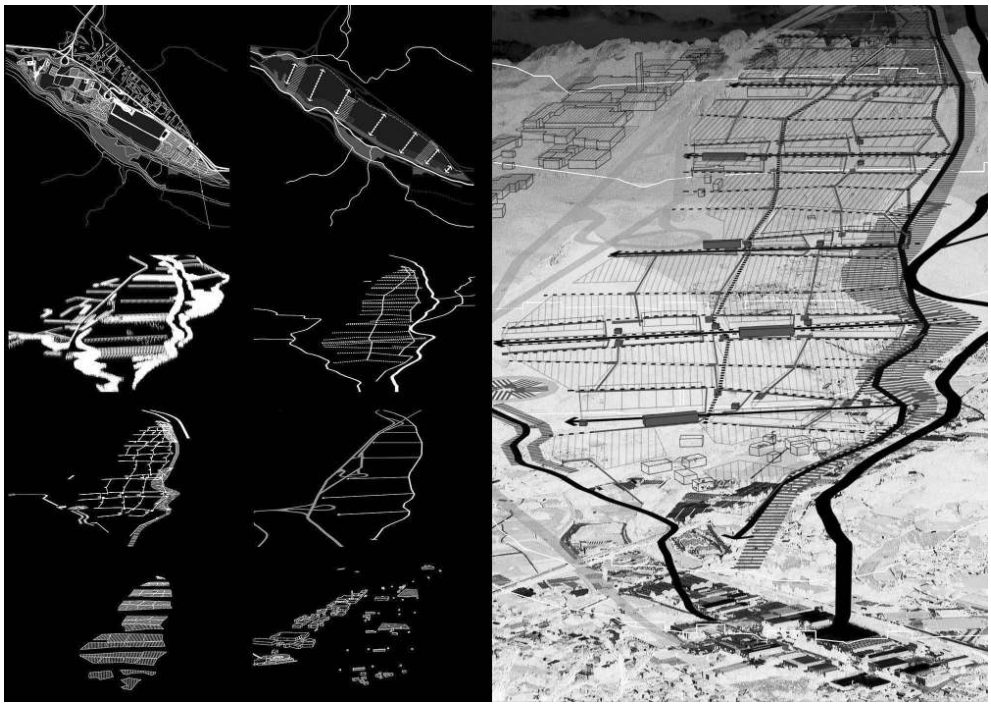
L. Zecchin.

30 Among the pilot area experiments, a significant case study concerns the Cirè industrial area (206,153 m², of which 7,665 m² are undeveloped) and the adjacent "*brownfield*" site (625,726 m²). The former constitutes a linear district at the base of the slope; its high degree of morphological incoherence, the heterogeneous quality of the settlement, and its low-density matrix represent the primary design challenges. The latter is characterized by a degraded portion and an uncertain future, partially resulting from post-extractive reclamation. The area also contains heterogeneous elements, including a waste platform, an electrical substation, an inert material processing facility, scattered houses, a refueling station, and numerous greenhouses.

31 The pilot project defines a new ecologically equipped landscape, encompassing the regeneration of edges, architectural and energy retrofitting, the enhancement of the river as a structuring element and blue-green infrastructure, the renaturalization of quarries, and the restoration of the network of agricultural ditches, as well as the creation of green corridors and penetrative green links from the city to the river. This new landscape forms a striped palimpsest (Figure 5), a matrix in which productive spaces, greenhouses, fields, and micro-enterprises can evolve over time. Industrial production and environmental challenges become opportunities to create a productive park, equipped with water infrastructures, green spaces, and recreational facilities. Larger facilities can be located in the voids of gravel quarries, establishing more appropriate and discreet visual relationships, while green penetrations, vegetated

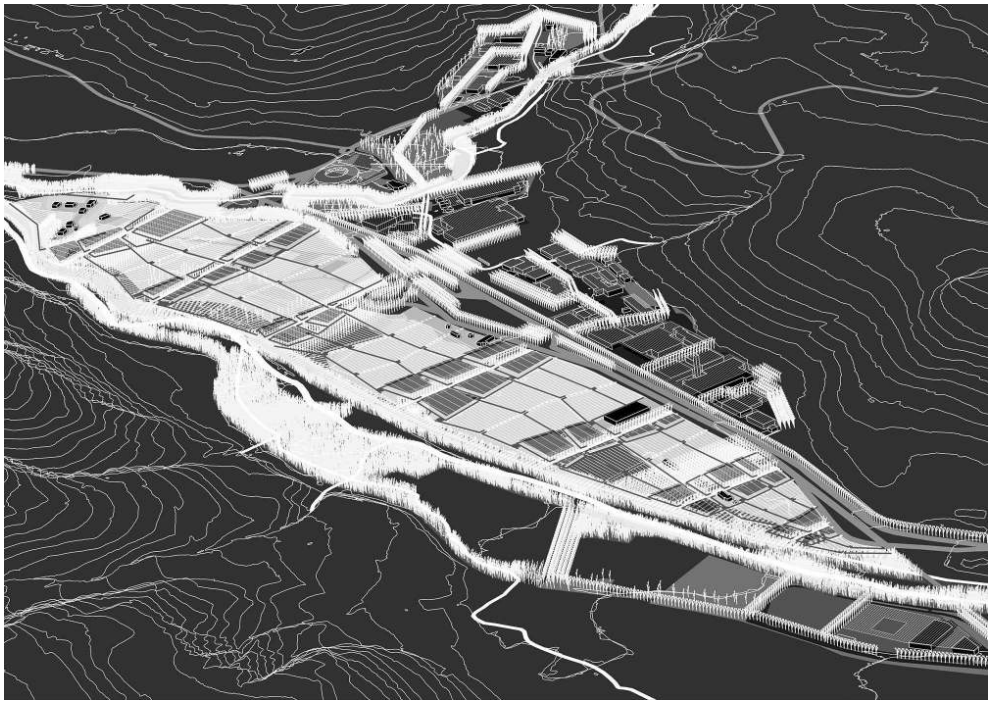
margins, and blue filaments delineate a permeable and vibrant structure, configuring a fully integrated ecological machine (Figure 6).

Figure 5. Striated palimpsest: composition of productive spaces, greenhouses, fields, and micro-enterprises in the landscape



L. Zecchin.

Figure 6. Integrated ecological machine: architecture of green corridors, vegetated edges and blue threads



L. Zecchin.

Conclusions

32 The characteristics of the studied context—anisotropic, topographically complex, and rich in diversity—allow heterogeneity and discontinuity to be recognized as values to be enhanced in fragmented "archipelagos" (Zecchin, 2017), rather than as elements to be homogenized. The project of anisotropy is determined by the geography that accommodates and conditions it. The section itself is a value; the mountain starts from below. Critical traces have accumulated in the low- and mid-mountain areas, constituting a particularly sensitive testing ground that requires careful intervention, not to continue erasing or exploiting it, but to restore it, regenerated, to the mountain as a coherent territorial architecture. This entails working on parts that are not picturesque, insignificant, or unacknowledged, which escape or are rendered invisible in the perceptual imagination of the mountain.

33 In the observed phenomenology, the reconsideration of production spaces interweaves living and working with the reconfiguration of open surfaces. The eco-efficient and resilient upgrading of the existing fabric—that is, according to a principle of inclusive sustainability encompassing environmental and landscape themes, urban and architectural quality, and energy production—can be pursued through the rationalization of land use, logistics, and territorial supply chains. This approach focuses on the regeneration of urban fabrics, on areas where industrial buildings are concentrated, on mitigating the environmental impact of production sites and any potential future expansions or new settlements, as well as on the identification of integrated ecological conversion measures at both the landscape and architectural scales.

34 The diffuse "mikrokosmos" of industrial production areas, in their fragmented fabrication, can be reimagined as "machines" for producing ecologies and repairing landscapes. The need to develop new forms of landscape, distinct from existing ones, starting from abandoned or underutilized spaces within production areas, intersects with climatic and environmental challenges, the enhancement of spatial and natural heritage, and the recovery of the existing fabric, without consuming additional land. These imperatives concern current industrial areas, including those still in use, which can become spaces capable of providing enhanced environmental quality, valorizing hybrid spaces, margins, and thresholds that define forms of production within the "city-landscape", thereby contributing to the attractiveness and competitiveness of these places.

35 Industrial and artisanal areas, often perceived as visually and environmentally impactful building aggregates, require a reconsideration that necessarily addresses their relationship—currently undervalued—with mountain morphology, the perspectives from both below and above, the intensification of natural elements within the built environment, and the network of urban relations. Wherever possible, functional and spatial "mixité" should be implemented, reintegrating production areas into polycentric circuits to transform them into attractive hubs and exchange nodes at a broad territorial scale, to be investigated through project-oriented, performative and systemic approaches.

36 This involves exploring projects connected to the architecture of gray infrastructure, such as service yards and parking areas, alongside blue and green infrastructures,

including hydrographic networks, green frameworks, and the diffuse porosity of equipped soils. These architectures experiment ecologically with the landscape quality of spaces, acting on the built environment through adaptive and resilient transformations, capable of gradually constructing a framework of the public city and common good in an extended sense. The underlying idea is to consider these fragments not as isolated entities, but as elements of a broader "archipelago", within which new relationships can be densified and woven, landscapes generated, and new hybridizations and commingling created, contributing to reflections on emerging urbanities and the future configurations of the "city-landscape" within the alpine "urban countryside," which can also be explored in analogous diffuse production forms.

BIBLIOGRAPHY

Augé M., 1992.– *Non-lieux. Introduction à une anthropologie de la surmodernité*, Paris, Éditions du Seuil.

Bätzing W., 2005.– *Le Alpi. Una regione unica al centro dell'Europa*, Torino, Bollati Boringhieri.

Berger A., 2006.– *Drosscape: Wasting Land in Urban America*, New York, Princeton Architectural Press.

Bertrand N., Vanpeene-Bruhier S., 2007.– "Periurban landscapes in mountain areas", *Journal of Alpine Research|Revue de géographie alpine*, vol. 95, nº 4, p. 69-80.

Bocchi R., 2010.– *Progettare lo spazio e il movimento. Scritti scelti di arte, architettura e paesaggio*, Roma, Gangemi Editore.

Bonomi A., 2013.– *Il capitalismo in-finito. Indagini sui territori della crisi*, Torino, Einaudi.

Corboz A., 1983.– *La ville, le territoire et le paysage*, Lausanne, L'Age d'Homme.

Corrado F., 2016.– "Abitare nei territori alpini di oggi: nuovi paradossi e l'esigenza di politiche abitative innovative", *Scienze del Territorio*, nº 4, pp. 67-74.

De Rossi A. (a cura di), 2018.– *Riabitare l'Italia. Le aree interne tra abbandoni e riconquiste*, Roma, Donzelli.

Diener R., Herzog J., Meili M., de Meuron P., Schmid C., 2005.– *La Suisse - portrait urbain*, Basel-Boston-Berlin, Birkhäuser.

European Commission, 2013.– *Green infrastructure: enhancing Europe's natural capital*, Bruxelles, European Commission.

Koolhaas R., 2006.– *Junkspace. Per un ripensamento radicale dello spazio urbano*, Macerata, Quodlibet.

Mercalli L., Sasso C., 2004.– *Le mucche non mangiano cemento. Viaggio tra gli ultimi pastori di Valsusa e l'avanzata del calcestruzzo*, Torino, SMS.

Modica M., 2022.– “The Alps as context: Brownfield redevelopment and industrial legacies in the Alpine landscape”, *Alpine Industrial Landscapes. RaumFragen: Stadt – Region – Landschaft*, Wiesbaden, Springer VS, pp. 29-61.

Perlik M., Messerli P., Bätzing J., 2001.– “Towns in the Alps. Urbanization processes, economic structure, and demarcation of European functional urban areas (EFUAs) in the Alps”, *Mountain Research and Development* vol. 21, nº 3, pp. 243–252.

Perlik M., 2022.– “L’urbanizzazione delle montagne: motore per società coese o fattore di distruzione delle comunità rurali?”, in L. Lorenzetti e R. Leggero (a cura di), *Montagne e territori ibridi tra urbanità e ruralità*, Mendrisio, Mendrisio Academy Press, pp. 59–74.

Samonà G., 1968.– *Piano urbanistico del Trentino*, Padova, Marsilio.

Samonà G., 1976.– *La città in estensione*, Palermo, Stass.

Secchi B., 2000.– *Prima lezione di urbanistica*, Roma, Laterza.

Secchi B., 2005.– *La città del ventesimo secolo*, Bari-Roma, Laterza.

Servizio Statistica della Provincia Autonoma di Trento.– Online: www.statistica.provincia.tn.it/dati_online, retrieved, February 10th, 2026.

Servizio di Pianificazione Urbanistica della Comunità di Valle Alta Valsugana e Bersntol.– Online: www.comunita.altavalsugana.tn.it/Aree-Tematiche/Urbanistica/Pianificazione/PTC-Piano-Territoriale-della-Comunita, retrieved, February 10th, 2026.

Varotto M., 2020.– *Montagne di mezzo. Una nuova geografia*, Milano, Einaudi.

Viganò P., 2015.– “Urbs in Horto: Nuovi cicli di vita per le placche industriali nella città diffusa”, in S. Munarin, L. Fabian e E. Donadoni, *Re-Cycle Veneto*, Ariccia, Aracne, pp. 231–233.

Zecchin L., 2012.– *L’architettura degli spazi marginali. Un approccio metodologico per i territori della bassa e media montagna / Marginal Spaces Architecture. A methodological approach for the territory of the low and medium mountain*, Trento, Trento University Press.

Zecchin L., 2017.– *Mikrokosmos. Industrial production areas in an alpine urban countryside*, Trento-Barcellona, LIStLab.

Zecchin L., 2019.– “Grey Green Blue. Compose with nature the landscape-city”, in A. Gospodini (a cura di), *Proceedings of the International Conference on Changing Cities IV: Spatial, Design, Landscape & Socio-Economic dimensions*, Volos, University of Thessaly UMLAB, pp. 677–690.

NOTES

1. The research “Aree e sistemi produttivi della Comunità Alta Valsugana e Bersntol. Linee guida aree paesaggisticamente ed ecologicamente attrezzate” was developed in collaboration with the Servizio di Pianificazione Urbanistica della Comunità di Valle Alta Valsugana e Bersntol, within the framework of the “Piano Territoriale di Comunità” (PTC). The methodological approach builds on the author’s previous studies on industrial production areas (2010–2017) and is part of the research project “ToxicTecture: metodi e strumenti per interventi integrati per la rigenerazione di insediamenti produttivi contaminati al fine di migliorare la resilienza” (L. Zecchin, 2023-ongoing), developed at the Dipartimento Politecnico di Ingegneria e Architettura (DPIA), University of Udine, in parallel with initiatives supporting the Piano Strategico di Ateneo 2022–2025, “Progetto Interdipartimentale ESPeRT Energia, Sostenibilità dei Processi Produttivi e Resilienza Territoriale per la Transizione Ecologica”.

ABSTRACTS

How is the mountain landscape transformed by the dispersed development of industrial production? How can productive areas be rethought within complex orographic contexts? This article addresses the project-related challenges posed by scattered industrial areas in alpine urbanities through a case study in Trentino. The diffusion of productive settlements in the Alps is interpreted as part of a broader condition that also characterizes dispersed urban forms in lowland areas, where the proliferation of productive fragments – underutilized spaces, abandoned buildings, unsold industrial sheds, vacant plots – contributes to the construction of an "urban countryside" shaped by processes of peripheral urbanization and incremental land consumption. The project challenge concerns the need to rationalize settlements and to repair the landscape by initiating processes of environmental and functional regeneration. The specific characteristics of the orographic context, its "territorial anisotropy" and the richness of its diversities, make it possible to recognize heterogeneity and discontinuity as values: resources for a project of coexistence among dissimilar elements configured as productive "archipelagos". Low- and mid-altitude mountain areas thus represent a sensitive testing ground for rearticulating industrial zones as components of a territorial architecture in transition. This approach entails intervening in neglected, marginal, or discarded areas that escape common perception and are often considered insignificant. Understanding these spaces and reinterpreting their relationships with broader contexts anticipates project elements and logics that enable productive settlements to be reconsidered as constructions capable of generating ecologies and landscapes, thereby contributing to a reflection on emerging urbanities and the future configurations of the "landscape-city".

INDEX

Keywords: industrial Alps, productive archipelagos, mid-mountain areas, transition projects, alpine urbanity

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