

Fragments of the Iron Curtain – The Polveriera of Romans d’Isonzo: A Methodological Experiment between Architecture and Landscape

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The article accounts the results of an applicative research carried out by researchers from the University of Trieste for the recovery, conversion and architectural, landscape, environmental and infrastructural reuse of a large military area, abandoned for over twenty years, located in the territory of Gorizia, in Friuli Venezia Giulia. The area was a former powder magazine dating back to the Cold War period. A garrison at the service of the former border called “Iron Curtain” that passed right near the Municipality of Romans d’Isonzo, on the Gorizia and Trieste Carso. The area was abandoned for decades and has been invaded by lush vegetation and meadows of important ecological value. Today, in addition to its considerable localization and extension potential, it has a significant strategic value for the vast area on which it stands: the low Isonzo plain. The study experimented with a methodology for the construction of the transformation forecast, working extensively on the use and applicability of simulation tools (indicators, scenarios, visions) and then on the processes of evaluating the impacts and consequences of the transformations at different scales and for different territorial areas (internal and external). The study adds to the discussion, not only the intrinsic results, the effectiveness or not of the reconversion project of this discussed military area, but also the development of a working scientific method (analysis, design and evaluation), and therefore, the construction of an operational model that can be exported to other case studies (on other military sites in the Friuli Venezia Giulia region) and on other contexts (in general on abandoned or disused areas).

Introduction - Redevelopment, Conversion and Reuse of a Former Military Site: Architecture Designed with Nature

The paper deals with the results of a scientific research carried out at the Department of Engineering and Architecture, University of Trieste, by the two authors, relating to the tools and methods of redevelopment, conversion and reuse of a former military site (Figure 1), the former – Polveriera di Romans d’Isonzo – Gorizia (Figure 2) in Friuli Venezia Giulia, from an architectural, landscape and infrastructural point of view. It is a large area (near the former Iron Curtain, between Italy and the former Yugoslavia), abandoned since the end of the Cold War (Figure 8a).

The general research activity has developed themes, tools and above all, methods of architectural recovery characteristic of large disused military sectors

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with attention to functional reconversion and integration with landscape qualities and potential, within a context strongly characterized by settlement dispersion and ecological fragmentation (Figure 6).

This research investigates a case study (Figure 3) that has as its specific and applicative object the functional, architectural, landscape and environmental recovery of the former Polveriera of Romas d'Isonzo (Gorizia – Italy). The area that is currently being studied, was a military ammunition depot before the decommissioning. It was built in the early 1980s, closed in the late 1990s, and was then sold by the Italian Army to the Municipality of Romans d'Isonzo in the early 2000s. For about 20 years the area was closed, thus becoming a sort of naturalistic “reserve” (Figure 8b), very interesting also for the environmental and landscape aspects. It is a very large area of about 100,000 square meters with about thirty buildings inside, surrounded by large earth embankments (Figure 2). The buildings are arranged according to an orthogonal grid that also draws the internal network of roads (Figure 7). The whole area is enclosed by a buffer about seven meters thick and access occurs only from a point on the northern part of the site (Figure 7).

In the last 20 years of neglect, the vegetation has re-appropriated the site, transforming it into a large prairie, which is technically defined as the “arid eastern sub-Mediterranean meadow”. In addition to the prairie, there are shrubs of weed brambles that have invaded all the powder pits and embankments, but that are nevertheless an important community of pioneers for the forest.¹ To the south, the area is bordered by a large depression in the ground, it is a relic of the ancient course of the Isonzo river, technically called the “Isonzo paleoalveo” (Figure 5). Inside the paleoalveo, a luxuriant multi-specific forest has spontaneously formed which constitutes a compact and continues naturalistic corridor that is, as of today, the only true element of landscape and environmental value of this area. The territorial location (Figure 3) of the former powder magazine is of great value as it fits into a quality agricultural context, with ponds and patches of vegetation (Figure 5).

Therefore, the research has two objectives, on the one hand to identify a directly applicable solution and on the other a methodology that can be exported to other similar cases, given the regional context in which it is located, and given the large patrimony of brownfield sites in Friuli Venezia Giulia.

1. *Ailanthus altissima* (P. Mill.) Swingle – Ailanthus; *Rubus ulmifolius* Schott - Common Bramble; *Polystichum setiferum* - Silk Fern; *Thymus vulgaris* L. – Thyme; *Populus nigra* L.- Black Poplar.



Figure 1. *Aerophotogrammetry, Year 2000. The Study Area in the Territorial Context*
Source: AGEA FVG.



Figure 2. *Aerial View of the Former Military Site. Polveriera di Romans d'Isonzo (Gorizia, Italy) 2021*
Source: Research team.

Literature Review – Scenarios, Self-Naturalization, Recycle Landscapes, Reuse Architecture

The literature review that follows is articulated in the different disciplinary fields and in the different thematic areas of interest to the present study. The first

theme concerns the methodology of scenarios that was used for the development of the project, a second area deals with the theme of sustainability and the future in architecture, the phenomena of re-appropriation of abandoned spaces by nature, architectural approaches to the theme of reuse. A third part deals with the specificities and dynamics of the areas near the border, to conclude with the theme of disused military areas, with particular reference to the territorial scope of the project.

According to Franco Purini, “together with writing, drawing is one of the few languages capable of making time visible”.² This statement establishes the possibility of not considering time only as a single, continuous, one-way flow. Through the design, and therefore through the project, it is possible to bring to light both past and present experiences, but above all, future ones. Consequently, it is therefore possible to fix knowledge through the use of drawing, a multiplicity of visions belonging to different alternative futures, to different times and ultimately to different *possible worlds*. This approach is, of course, also found in literature. In his essay, *Heterocosmica*, Lubomir Doležel deals with the concept of *fiction* through the paradigm of possible worlds, a universe that “constantly expands and diversifies.”³ This approach allows you to move away from the doctrine of mimesis,⁴ that is, from the idea that the work of imagination, and therefore also the project, can only be an imitation or representation of human experience limited to the current world and to the present time. The reductionist risk of such an approach is evident. Limiting oneself to developing the project as a simple extrapolation of past experiences or present conditions (typical analytical methodology based on the construction of cognitive frameworks of a predictive nature, defined on the basis of information collected in the past), guarantees an improvement trend in terms of optimization of design solutions, so-called “good practices”, but nevertheless does not offer any structural possibility to the project to make significant evolutionary leaps forward.

The paradigm of possible worlds though, recalls the concept of the *sense of possibility*, expressed by Robert Musil in *L'uomo senza qualità* (Man Without Qualities):

“If the sense of reality exists, and no one can doubt that its existence is justified, then there must also be something that we will call a sense of possibility. Those who possess it do not say, for example: this or that has happened here, it will happen, it must happen; but imagine: here it could or it should happen, this or another thing; and if you tell him that something is as it is, he thinks: well, it could probably be different. So that the sense of possibility could also be defined as the ability to think all that could be, and not to give more importance to what is, than to what is not.”⁵

2. F. Purini, *Gli Spazi Del Tempo. Il Disegno Come Memoria e Misura Delle Cose*, 2011.

3. L. Doležel, *Heterocosmica: fiction e mondi possibili* (Milano: Bompiani, 1999), IX.

4. Ibid, X.

5. R. Musil, *L'uomo senza qualità* (Torino: Einaudi, 1956), 12-13.

These worlds have been given the name of *scenarios*, shaped from the sense of possibility, from the disciplinary point of view. The methodology of scenarios⁶ was developed after the Second World War as a tool for describing possible futures. It is part of a group of techniques such as formal game theory and gaming simulation, aimed at training and strategic analysis in military environments.

The main definitions refer to studies completed in the United States and published starting from the second half of the 1960s. However, an interesting precedent of an applicative nature can be identified in the Assisi plan, drawn up by Giovanni Astengo in the 1950s. Astengo's technique develops through the so-called implicit scenarios, scenarios expressed in textual form and not visualized through drawn representations. Some fundamental elements that constitute the structure of the conditional scenario remain unchanged, starting from the question "what would happen if?": the identification of a desirable future, an ideal scenario, the definition of a trend-based scenario on the extrapolation of current conditions, and the recognition of a latent scenario of a pessimistic nature, in the event that threats arise, and weaknesses are not remedied.

In 1959, however, Saverio Muratori proposed an application of explicit scenarios on the occasion of the Sandbanks of San Giuliano, in the Venice lagoon. Instead of just one project, Muratori presents three. These are three scenarios (a scheme based on the archipelago of Venetian islands of the year 1000, one on the continuity of Gothic Venice and finally the last on the Venice of the 16th-17th century), developed starting from his research on historical Venetian settlement typologies.⁷

Muratori's is a complex approach, first of all because the proposed scenarios should not only be considered as alternatives to each other, but should be seen in an evolutionary sense, a sequential development of three solutions with increasing complexity. Furthermore, because Muratori opens a controversy with the urban planning discipline, precisely in relation to the forecasting capacity of the latter,⁸ to which he proposes a form of *creative continuity*,⁹ starting from the survey and analysis of the different building types and the different urban fabrics that have developed over the centuries in Venice.

The planning field has often drawn on these techniques. A broad line of research on scenarios was led by the Research Doctorate in Urban Planning of the IUAV, coordinated by Bernardo Secchi. Various publications followed these activities, the *Quaderni*¹⁰ which dealt with these topics in some monographic issues. Secchi's reflections on the theme of scenarios are also different, starting

6. L. Vettoreto, *La costruzione di scenari per la città contemporanea: ipotesi e casi di studio* (Venezia: IUAV, 2001). Scenarios: an introduction of the case studies and some research perspectives – Luciano Vettoreto.

7. S. Muratori, *Studi per una operante storia urbana di Venezia* (Roma: Istituto poligrafico dello Stato: Libreria, 1960).

8. Ibid, 16.

9. Ibid, 40.

10. Vettoreto, *La costruzione di scenari per la città contemporanea*, 2001; P. Viganò, *Nuovi Territori: Situazioni, Scenari, Progetti per La Città e Il Territorio Europei* (Italy, Europe: Officina Edizioni, 2004).

from the references contained in the *Prima lezione di urbanistica*¹¹ (First Lesson of Urban Planning) and in a series of articles in the online magazine *Planum*.¹² Secchi identifies the resumption of this methodology¹³ in the research of MVRDV, starting from the development of their *Datascape*.¹⁴

Recently, these techniques have been taken up in the studies for the development of the Trieste Airport. In this case, starting from the project of an intermodal hub, the saturation level of the airport service infrastructure was assessed through three development scenarios: the minimum reversible scenario, the optimal scenario and the crisis scenario, with maximum saturation of the service level of the infrastructure. It is no coincidence that the research report is titled *Le regole del gioco*¹⁵ (The Rules of the Game), the reference is directed to the origins of the scenario as a real form of play.¹⁶

The idea of investigating possible futures implies a principle of sustainability, the design action is a path from the known to the unknown, from the probable to the possible. Therefore, a problem of safeguarding and protecting the future, also arises. As Albert O. Hirschman argues in various writings, one must leave future generations, as many options as possible.¹⁷ The theme of future generations is addressed by Benno Albrecht, from a typically architectural point of view, through the analysis of the thought of John Ruskin, William Morris e George Perkins Marsh in *Conservare il futuro*¹⁸ (Conversing the future).

The sufficiently well-known positions of Ruskin and Morris are accompanied by the reading of Marsh who for the first time¹⁹ recognizes the value of man as a geographical modifier of the planet and that architecture recognizes the task of dealing with these modifications, pursuing an aim of control and sustainability. The principle of reuse of resources in architecture then, addresses the theme of abandoned areas. In literature the main contributions concern brownfields, abandoned industrialized areas, *in between areas, waste land, terrain vague, tiers*

11. B. Secchi, *Prima lezione di urbanistica* (Roma: Laterza, 2000).

12. Bernardo Secchi, 'Diario 06 | Scenari' (Diary 06 | Scenarios) (Planum association), accessed 4 June 2022, <http://www.planum.net/diario-06-scenari-bernardo-secchi>; Bernardo Secchi, 'Diario 08 | Tre parole' (Diary 08 | Three Words) (Planum association), accessed 4 June 2022, <http://www.planum.net/diario-08-tre-parole-bernardo-secchi>; Bernardo Secchi, 'Diario 10 | Progetti, visions, scenari' (Diary 10 | Projects, visions, scenarios) (Planum association), accessed 4 June 2022, <http://www.planum.net/diario-10-progetti-visions-scenari-bernardo-secchi>.

13. Secchi, *Prima lezione di urbanistica*, 2000, 171.

14. MVRDV, *Farmax: Excursions on Density* (Rotterdam, 1998); MVRDV, *Metacity Datatown* (Rotterdam: 010 Publishers, 1999).

15. G. Fraziano, *Le regole del gioco: scenari architettonici e infrastrutturali per l'aeroporto FVG* (Trieste: EUT Edizioni Università di Trieste, 2015).

16. Vettoreto, *La costruzione di scenari per la città contemporanea: ipotesi e casi di studio*, 2001, 18.

17. A. O. Hirschman, *Felicità privata e felicità pubblica* (Bologna: Il Mulino, 1983); A. O. Hirschman, *Ascesa e declino dell'economia dello sviluppo: e altri saggi* (Torino: Rosenberg & Sellier, 1983).

18. B. Albrecht, *Conservare il futuro: il pensiero della sostenibilità in architettura* (Il poligrafo, 2012).

19. G. Perkins Marsh, *Man and Nature, or Physical Geography as Modified by Human Action by George P. Marsh* (BNCF, 1864).

paysage. A series of definitions that according to Alessandro Gabianelli²⁰ highlight the multiplicity of interpretations and the complexity of these places, but also the difficulty of defining clear and precise categories that allow to identify such spaces. However, Gabianelli underlines a common characteristic, the most significant contemporary public spaces, arise from the transformation of these typologies of places.

Among these residual spaces, Alan Berger²¹ particularly recognizes the *Drosscapes*. *Scapes*, landscapes, therefore, complex places, but with a residual character, left over from the transformation processes of the territory.

The aesthetics of waste, residue and its reuse has been consolidated in Italy since 2011 with the *Re-Cycle* exhibition curated by Pippo Ciorra and Sara Marini. A *tentative theory*²² according to which architecture is not just a recyclable material but a contemporary form of expression among the most current and sophisticated. This is a theoretical position of great clarity and effectiveness: the concept of recycling applied to architecture, while not denying the history, context and identity of an artifact, explicitly presupposes its possible transformation.

The concept of recycling proposed by Ciorra and Marini has the merit of placing the architectural dimension of the interventions in the foreground. In fact, the theme of reuse and transformation had already developed between the 80s and 90s. With two editorials for Casabella, Vittorio Gregotti traces a path from *modification* to *abandoned areas*. The limit of these positions, however, lay in observing the phenomenon from a predominantly urbanistic point of view,²³ still linked to a modernist approach.

According to Piero Zanini, borders are made up of residues and scraps, of marginal elements.²⁴ Accumulation areas, precisely of those urban and architectural materials and activities that we do not want to consider an integral part, or at least central elements, of our territories. Scraps, which are, however, indispensable to us, also because they function as tangible elements of a limit, which in some cases become an ecological frontier.²⁵

A significant case of ecological frontier, but with a positive meaning, is the European Green Belt (EGB). An ecological network, but also a system of landscapes of memory on a pan-European scale, divided into four macro-regions (Fennoscandian, Baltic, Central European and Balkan Green Belt), which goes from Norway to Turkey. An ecological corridor of 12,500 km that passes along the old *Iron Curtain*. This peripheral condition, characterized by few infrastructures

20. A. Gabbianelli, *Spazi residuali: la vegetazione nei processi di rigenerazione urbana* (Gorizia: GoToEco, 2017).

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

22. P. Ciorra and Sara Marini, *Re-cycle: strategie per l'architettura, la città il pianeta pianeta* (Milano; Roma: Electa : Maxxi, 2011), 18.

23. Ibid, 19.

24. P. Zanini, *Significati del confine: i limiti naturali, storici, mentali* (Milano: Bruno Mondadori, 1997), 9.

25. Ibid, 24.

and settlements, has allowed the conversation and development of habitats rich in biodiversity with a limited level of fragmentation.²⁶

The EGB becomes part of those global infrastructures that make up the *architectures of the world*.²⁷ Visions of the planet as a system of networks where scenarios²⁸ can be implemented on a large or very large scale.

Moving from global to local, these issues can be found by studying the effects and consequences of the decommissioning of military sites in Friuli Venezia Giulia, the easternmost and most militarized region in Italy. The literature is extensive on the decommissioning of military areas after the fall of the Berlin Wall, the first references²⁹ dating back to 2003 can be found within more general issues.

A few years later, starting from 2010... *Dietro front!*³⁰ (Retreat!), *Fortezza FVG*³¹ (Fortress FVG) and *Un Paese di primule e caserme*³² (A Country of Primoses and Barracks), opened a reflection of a more systematic nature, with a broader view of the entire regional system and the re-appropriation by local communities of these common goods.³³

These are contributions that collaborate to define a horizon of *military landscapes*³⁴ that is geographically increasingly vast and disciplinarily heterogeneous.

Studies are currently continuing along various lines,³⁵ both theoretical and operational, as in the present study, which through the investigation of a *minimal landscape*,³⁶ intends to explore phenomena of territorial scope through the instrument of architectural design.

26. R. T. T. Forman, *Land mosaics: the ecology of landscapes and regions* (Cambridge: Cambridge University Press, 1995).

27. A. Ferlenga et al. (Eds.) *L'architettura del mondo: infrastrutture, mobilità, nuovi paesaggi* (Bologna: Editrice Compositori, 2012), 76.

28. Ibid, 83.

29. U. Leone (Ed.), *Aree dismesse e verde urbano: nuovi paesaggi in Italia*, 1st Edition Geografia e organizzazione dello sviluppo territoriale (Bologna: Pàtron, 2003), 30, 34.

30. A. Dapretto and P. Ongaro (Eds.), *Dietro-Front!*, Architettiregione 46 (Trieste: Federazione degli Ordini degli Architetti, Pianificatori, Paesaggisti e Conservatori del Friuli Venezia Giulia, 2010).

31. M. Baccichet, Giorgio Zanin, and Elia Mioni, *Fortezza FVG: dalla guerra fredda alle aree militari dismesse*, Ambiente e territorio (Monfalcone: Edicom, 2015).

32. Corde architetti, *Un paese di primule e caserme caserme* (Pordenone: Cinemazero, 2016).

33. A. Marin and V. Leoni, *Territori e Immobili Demaniali Dismessi Come Beni Comuni. Introduzione* (Italy: Società di Studi Geografici, 2016).

34. D. R. Fiorino, and G. Damiani, *Military Landscapes: Scenari per Il Futuro Del Patrimonio Militare: Un Confronto Internazionale in Occasione Del 150. Anniversario Della Dismissione Delle Piazzeforti Militari in Italia* (Skira, 2017).

35. E. Marchigiani, *Il riuso delle caserme in piccole e medie città: questioni di progetto a partire dal Friuli Venezia Giulia*, Esercizi di ricerca e progetto sulla città (Trieste: EUT Edizioni Università di Trieste, 2022).

36. S. Basso, *Nel confine: riletture del territorio transfrontaliero italo-sloveno* (Trieste, 2010), 121.

Materials and Methods - Design with Simulation

The area of the former Polveriera di Romans d'Isonzo has considerable potential deriving from its location in a strategic infrastructural node (Figure 4), near the motorway exit between A36 Villesse - Gorizia and the A4 Trieste – Venice (Figure 3). The abandonment of the area for about 30 years has allowed the “reactivation” of spontaneous environmental dynamics as a second nature, especially in the vicinity of the paleo riverbed of the Isonzo river (principle of Nature of the Fourth type by A. Gabbianelli,³⁷ or of Second nature by A. Geuze³⁸ and even before the Third Landscape by G. Clement³⁹), to the detriment of the military building heritage to date, that is however still abandoned. Given the considerable size of the area (over 20 hectares), equal to the entire inhabited center of the municipality in which it is located, the building heritage (almost thirty buildings), contained within the proximity, the system of lakes deriving from former quarries, the surrounding intensive agricultural fabric and belonging to a particular polycentric territorial system, the former military sector has a natural strategic vocation not only for the Municipality in which it is located, but for the whole territory of the Gorizia plain.

The interest of the research concerns, in particular, the development of the methodology with which the multicriteria analysis phase was integrated, that of data interpretation and processing of the transformation project. The approach to recovery strategies saw the development of 7 scenarios, as metaprojects, based on the demand for transformation, “what would happen if...” (Figure 10b, c, d, e, f, g, h) according to the historic methodology devised by Giovanni Astengo at the end of the 1950s. From here we returned to the analysis, identifying 7 territorial transformation indicators to define the scenarios in context. The scenarios were then “tested” with possible stakeholders. The 7 transformation hypotheses were recombined (matrix) and synthesized into 3 more complex and alternative hypotheses. These three trend scenarios were then integrated into a “structure scheme” (Figure 9b, c, d, e, f, g, h) which became the basis for the masterplan. This “analytical method”, partly deductive and partly inductive, has made it possible to develop divergent hypotheses, positive and negative, to visualize the effects of the different configurations of the area (architectural, landscape, environmental, infrastructural) and to evaluate the internal (architectural) and external (urban and functional on the surrounding territory) impacts, but above all, it allowed to understand the limits of use, the crisis condition, and the structural elements (for example the environmental frame).

37. A. Gabbianelli, “Quarto,” in *Vesper Architecture Magazine, Arts and Theory*, no. 3 (Macerata: Quodlibet, 2020), 217

38. A. Geuze, and M. Skjonsberg, “Second Nature,” in *Landscape as Infrastructure. A Base Primer* (ed.) P. Belanger (New York: Routledge, 2016).

39. G. Clement, *Manifesto del terzo paesaggio* (Macerata: Quodlibet, 2005).

The results that we present here intend to demonstrate the effectiveness of the methodology adopted in giving solutions to complex problems, according to the principle that the universe of possible worlds is constantly expanding and diversifying. In fact, critical design, generating alternatives, is able to create “compasses” instead of “maps”, to offer less rigid and more resilient design solutions in an increasingly dynamic and changing reality.

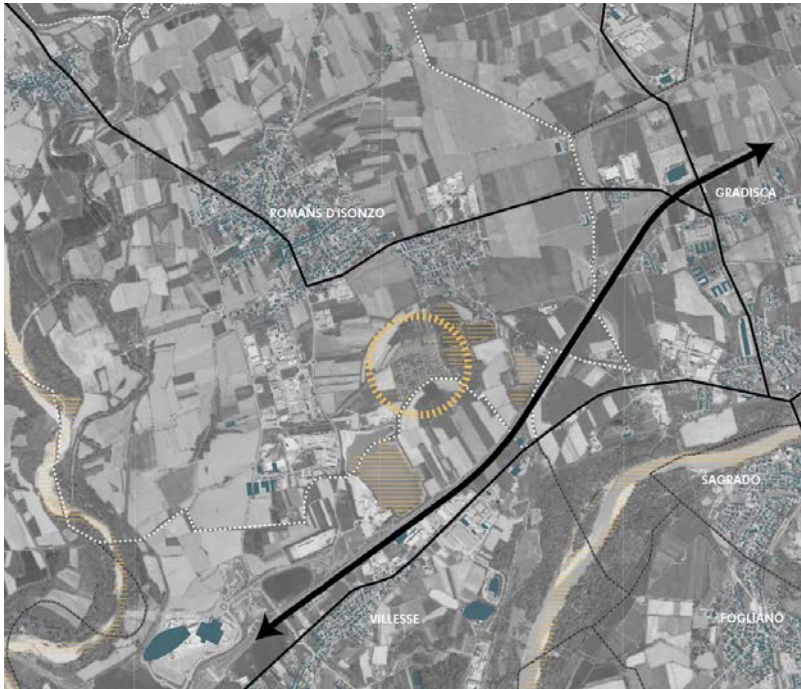


Figure 3. *Location. Infrastructure Networks and Catchment Area (Romans d'Isonzo, Gorizia, Italy) 2021*

Source: Research team.

This study stems from the need of the Municipal administration of Romans d'Isonzo to collect “ideas and tools” to reuse, recover and reconvert the large military sector of the former Polveriera. The primary aim of the research is therefore, to provide a technical, scientific and methodological answer to the question “what to do?” and “how to do it?”. The aim then, is not a finished design solution, but a working method (between analysis and project) and a set of alternative reconfigurations in the form of forecasts, in order to be able to make overall (for functional, territorial, etc.) and comparative considerations (is it convenient? Does it impact? Does it work?), and then on how to insert (buildings, open spaces, roads, quantities, types, permeability, etc.).

The themes and contents developed during the research are the following:

1. Overall reorganization of the urban layout and new intended use.
2. Evaluation of the methods of recovery of existing buildings (conservative restoration, restoration and expansion, partial demolition and new construction, demolition and reconstruction).

3. Sizing of the “settlement load” in relation to the environmental system, the road network and access to the area.
4. Organization of car parks in relation to the catchment area.
5. Connection with external roads.
6. Layout of soils, vegetation and the environmental system.
7. Relation to the surrounding countryside and possible interference.

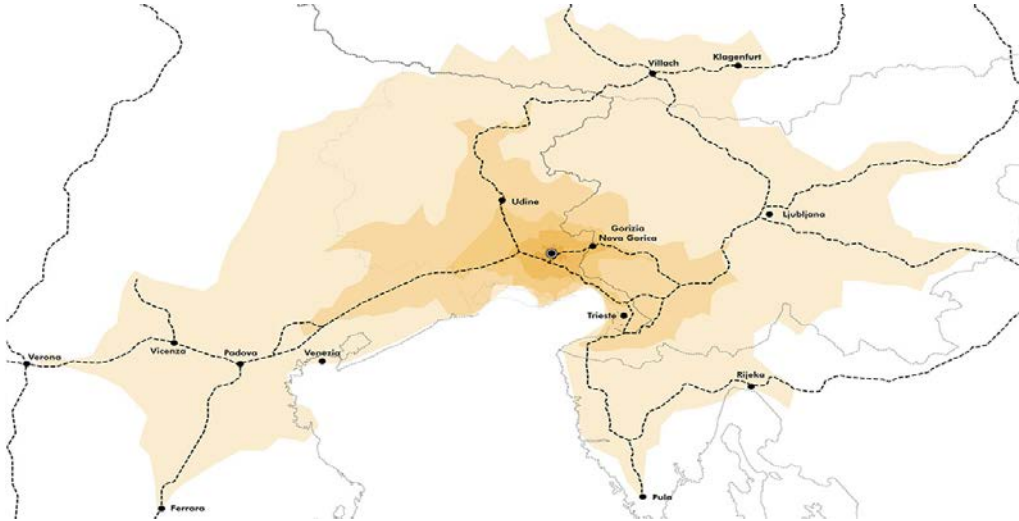


Figure 4. Relationship Map. Isochrones Processed on the Road Network in the Cross-Border Macro-Region (Italy, Austria, Slovenia) 2021

Source: Research team.

The study had a dual purpose: The first, concerns the identification of the themes, methods and tools to be used (methodology) to set up the area’s reconversion path. It should be clarified right away that this research is preparatory to the future design of the former military sector, it is not a project, but a metaproject. The study therefore has an exploratory and cognitive purpose. The *goal* is to trace a path of evolution over time and to allow the evaluation of the impact of the transformation.

The second, concerns the identification of alternative transformation configurations (layouts), capable of accommodating compatible and propulsive functions for the landscape, architectural and infrastructural reorganization of the area itself in relation to the reference context.

The large military sector was originally an agricultural area inserted in a vast and uniform countryside (Figure 5), itself part of a very homogeneous historical-geographical context of reference (Figure 1), in which the powder magazine constitutes the only discontinuity. Here, there is a very simple and continuous history of the territory: it has always been countryside, and around it there is countryside. This is why we felt the need to investigate widely, to look for stimuli, even if far away, and then “build a new history” of the territory starting from small things, in search of possible complexity and articulation. We have proposed a path that starts from the reconstruction of the context (history and geography) between the qualities of the landscape, the characteristics of the architecture and the design of the infrastructures. Costantino Dardi argued that the project must be based on

“contextual relations”,⁴⁰ or rather on the search for “external connection structures” because they are naturally able to give meaning to the project.

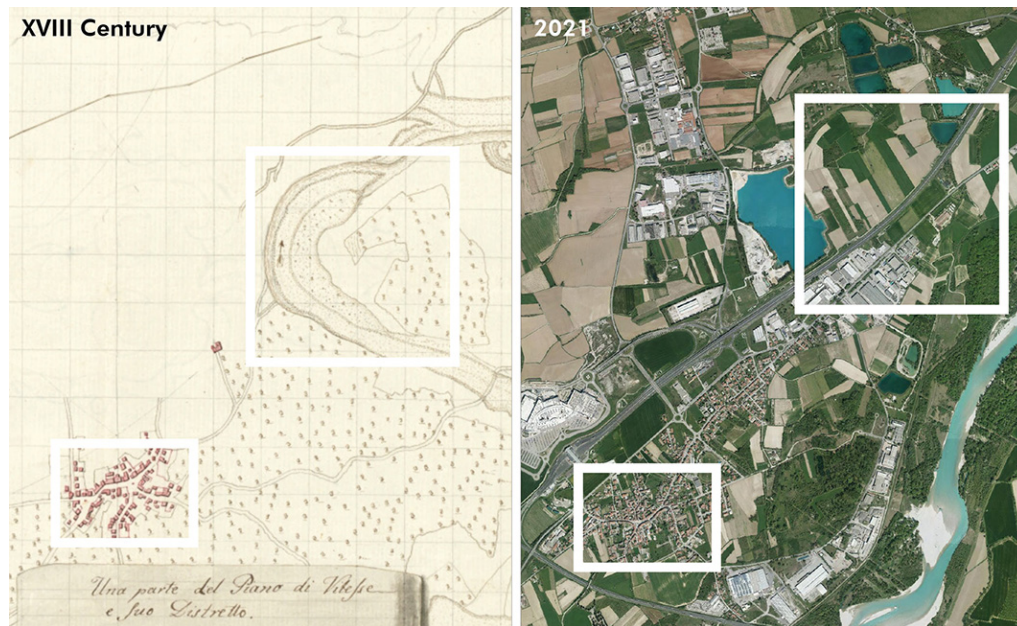


Figure 5. Historical Evolution of the Territory and Relationship Between the Case-Study Area and the Cities of Romans d'Isonzo and Villesse (Gorizia, Italy) 2021
Source: Research team.

40. C. Dardi, *Semplice lineare complesso. L'acquedotto di Spoleto* (Roma: Edizioni Kappa, 1977), 255-256.

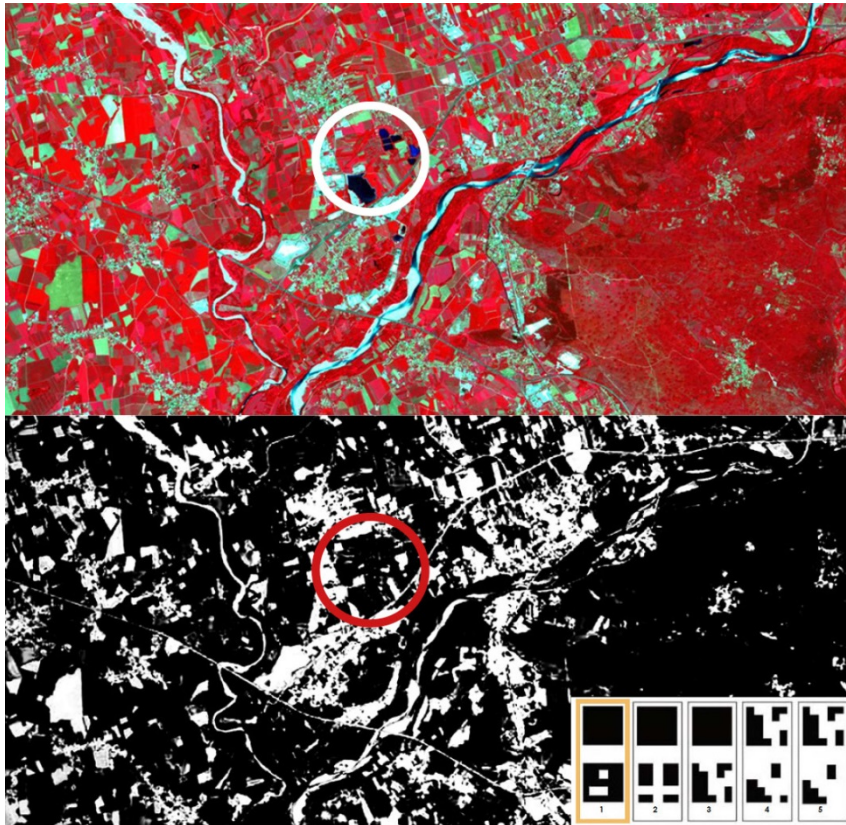


Figure 6. Analysis of the Ecological Fragmentation of the Surrounding Area According to Forman's Model (Gorizia, Italy) 2021
 Source: Research team.

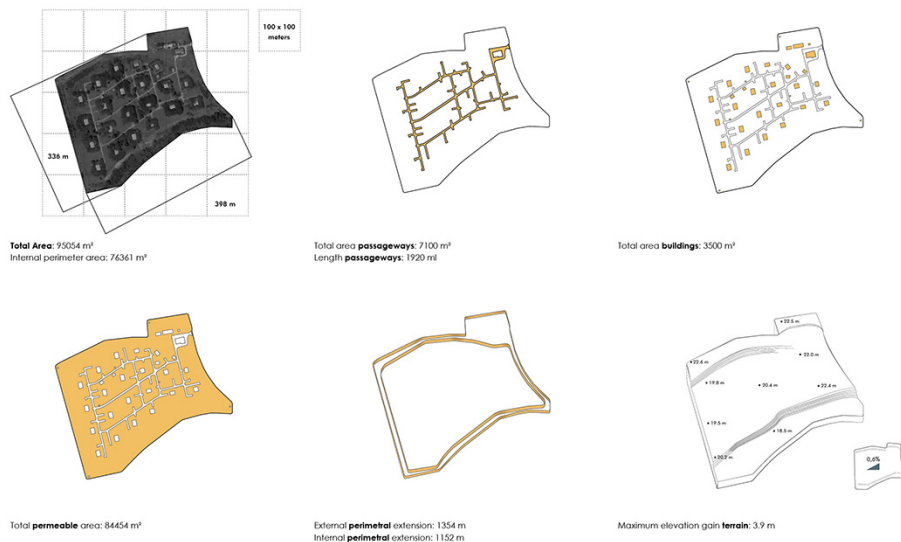


Figure 7. Morphological Study of the Former Military Site. Layout, Grids and Routes, Functionality Internal Roads, Buildings, Fortified Perimeter, Ground and Open Spaces (Romans d'Isonzo, Gorizia, Italy) 2021
 Source: Research team.

The research, which lasted longer than a year, was developed in ten phases. Each phase was verified and shared, each time, with the Public Administration and with the main stakeholders. It was therefore, a participatory process. The analysis phases alternated with those of design and simulation, according to a non-linear⁴¹ path. At the same time, the research was also fueled by the results of the didactic experiments carried out with the final dissertations within the Integrated Design Laboratory of 2019-2020 and 2020-2021.

The research was developed through the construction of alternative scenarios, through those ten visions for the future, 10 metaprojects (7+3) contained in the scenarios (Figures 10-11). By proposing these ten visions for the future as points for reflection and open discussion, even by radicalizing the conflict and contradictions, we have explored the possible extremes: the limits of the future project.

The study has developed analysis on various disciplinary fields (territorial, urban, infrastructural, environmental, historical and architectural), from which data were drawn that “indicate” the potential and criticalities of the area: scenario indicators. Through the “size” and quantity of the scenario indicators (Figure 8), seven transformation hypotheses (forecasts) were developed, with an exploratory survey character under different profiles: capacity of the road system and mobility, capacity of the production and commercial system and of the hospitality system and of services, capacity of the settlement system and of the vegetation structure. The indicators are the capability of indices (ratio between direct measures) and therefore indicate the levels with which we then built the scenarios:

- a.) Level of service, indicator for the infrastructure system.
- b.) Level of territorial fragmentation and land consumption, an indicator for the production and commercial system.
- c.) Reception level, indicator for the tourist accommodation system.
- d.) Level of urban load and rare functions, indicator for the settlement and service system.

The choice of the indicator a.) is linked to the location of the area in relation to the service level of the infrastructural system, since any choice of conversation of the former Polveriera will require a significant level of accessibility both from the north, from SR 252, and from the south, from the SP3 up to the Villesse motorway junction.

41. The steps of the research are as follows: Phase 1: Thematic cartographic analyses, Data collection and interpretation, field inspections; Phase 2: Identification of the design themes and possible functions and activities that can be established; Phase 3: Presentation of results from Phase 1 and 2, discussion and verification with the PA; Phase 4: From the results of Phases 1, 2, and 3, extrapolation of the main work topics and identification of the scenario indicators. Check scenario indicators with the PA; Phase 5: Elaboration of 7 exploratory scenarios; Phase 6: Public presentation of the results of Phase 5, discussion and verification of scenarios with the PA. Listening tables and open discussions with the main stakeholders; Phase 7: From the results of Phases 5 and 6, verify “shared” scenarios, comparative evaluation of scenarios to be discarded and identification of issues to extrapolate/discard from each scenario. Setting 3 synthesis scenarios and sharing with the PA; Phase 8: From Phase 7, elaboration of the 3 synthesis scenarios; Phase 9: Presentation to the Administration of 3 summary scenarios; Phase 10: From the comparative elaboration of the 3 summary scenarios, extrapolation of the standards sheet and conclusions.

The indicator b.) was chosen for the size of the intervention in relation to the inevitable environmental impact assessments that a similar project will pose. Furthermore, the area under study is a fundamental piece of both the current local and regional environmental and landscape system, since it is part of one of the main corridors of the Regional Ecological Network (RER FVG) identified by the PPR FVG.

The indicator c.) derives from the intrinsic characteristics (potential) of the vast area of reference, the Isonzo territory, the Collio, the nearby Gorizia Carso: a polycentric territory with numerous excellences linked to rural traditions, food and wine chains, the history and memory of the places and the cultural heritage, that over time has also developed a receptive system, also rich in services, and spread throughout the Isonzo area.

The indicator d.) was partially inherited from a regional vision, also considering the barycentric location of the site in question with respect to the Friuli Venezia Giulia region. This indicator expresses the “shortcomings” at the macroscale of the so-called rare functions in relation to the settlement load of all those territories that represent potential catchment areas for the site of the former Polveriera.

Through these four indicators we have built the simulations and then, the 7 exploratory scenarios of the trends expressed by the territory. The seven exploratory scenarios were subjected to various checks and tests, including a satisfaction survey by the Administration and a verification with the main stakeholders. These verifications led to a further synthesis. This reduction provided the data and arguments for the development of 3 summary scenarios (Figure 11) that offer an overall and articulated, but more defined vision. We then further reworked these 3 synthesis scenarios in a “standard form” (Figure 12) by extrapolating on the one hand, the structural elements and the invariants, and on the other, the more flexible ones, the variables. This scientific method, partly deterministic and partly argumentative, has already been used and tested by our research group for the preparatory study for the project of the Intermodal Hub of Ronchi dei Legionary of Trieste Airport (Trieste – Italy).

Below is a brief outline of the method we used to elaborate the exploratory scenarios and the subsequent synthesis ones:

1. Identification of the question: “... what would happen if...”
2. Identification of the “field of application” (transformation area, areas of influence, catchment areas).
3. Identification of scenario indicators and transformation themes.
4. Definition of objectives, strategy and framework of alternative hypotheses.
5. Organization of the actors involved (public, private, etc.)
6. Dimensioning of spaces and functions (layout).
7. Definition of the main settlement rules and dimensional parameters.
8. Combination of phrases and time management (short, medium, long term).
9. Visualization of the hypothesized transformations (visioning).
10. Impact assessment and territorial implications.
11. Summary of results: extrapolation of system variables and in-variables.

12. Final verification test.

The work plan proposed through the scenario method provides for a preliminary study for some large possible and alternative hypotheses that are formulated in a schematic way to be compared with each other and possibly, subsequently reduced by later steps, for the extraction of a single, final model. This methodology is in contrast with forecasting in the classic sense of the term, as it deals with the extrapolation of trends from a series of historical data from which we try to imagine the future, starting from the past.

The scenario is a suitable tool for dealing with complexities, by isolating some specific aspects and asking the question “what would happen if...”. It is possible to proceed in “discrete portions”, thus fragmenting the problem into simple subunits. It is a method that has allowed us to imagine the development of a territorial phenomenon up to the extreme consequences, or at least to the most probable ones. This way, we have obtained some images of the future. These images can be inconsistent or in competition with each other, just as the subjects who support them can be in competition. In this case, it is not a methodological limitation but a series of possibilities to choose or mediate from by finding intermediate solutions. The scenario, applied to architectural research, is a form of critical design that generates alternatives, and it helps to build compasses for orientation, rather than creating pre-established maps. For this reason, the scenarios balance provocations with strong links to the real world; they have a hypothetical value and therefore it is irrelevant if they do not actually take place.

We have developed seven alternative, consciously divergent scenarios, which explore seven different development possibilities in the area. Specific contents have been identified for each scenario (Figure 10): an “analytical” layout, a functional scheme, the accessibility and mobility system, the demolition and construction budget and a summary structure scheme, as well as images (photo simulations insertions):

1. Stable Park. A mosaic of habitats with services and activities for the public and ecosystem services, an outdoor naturalistic museum.
2. Event City. Hypothesis of a large green area, characterized by arenas for hosting shows and major events.
3. Cold Park. The museum of the former Polveriera, as a testimony of the Cold War, integrated with themed sports activities.
4. Caravanserai. An infrastructure dedicated to accommodation for alternative forms of tourism.
5. Ecovillage. The idea of a residential development aimed at new inhabitants who seek alternative forms of quality of life.
6. Play Ground. A complex sports infrastructure, equipped not only with fields and equipment but also with accommodation capacity, a village to host major events related to sports activities.
7. Truck Parking. An area to support heavy traffic for the nearby motorways, strategic along the east-west axis with some logistics services.

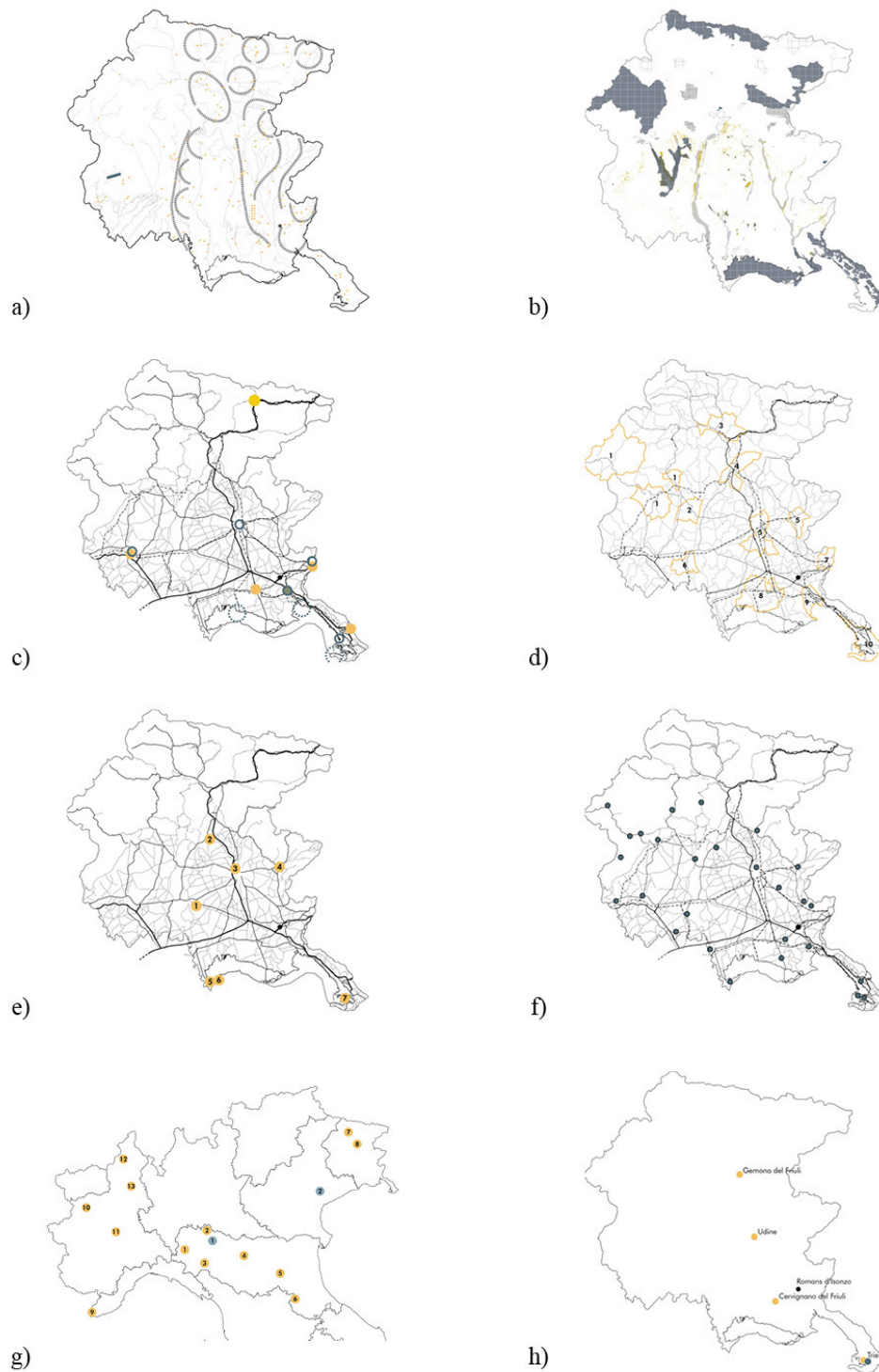


Figure 8. *Maps of the Indicators Used for Design of the Scenarios, 2021. a) Military Sites in the Region; b) Natural Reserves of the Region, Core Areas and Main Hydrographic Network; c) Infrastructural Network, Logistics, Ports and Airports; d) Production and Industrial Districts; e) Tourist Locations; f) Specialized Sports Centers and Major Events; g) Ecovillages; f) Cemeteries with Cremation Halls*
 Source: Research team.

The layout of each scenario identifies in detail, functions, locations, organization of open spaces and significant dimensions, where “visions” are added of the scenario, to also allow non-experts to be able to understand. From the layout, the seven functional schemes were then deduced as they recognized the precise perimeters and areas with unique functions. The structure scheme (Figure 9) of each scenario summarizes and transforms the scenario layout into a two-dimensional figure through perimeters and surfaces. The aim is to build a “simple”, “synthesis” figure, which – dried in the representation of the details – is comparable with the other scenarios and allows their combinations and synthesis. The synthesis scenarios are in fact obtainable starting from the comparison of the different structure schemes which identify the invariant elements among the “families of schemes” and can therefore act as a backbone. This way they are able to be “true” at the same, in several alternative hypotheses.

Results - Alternative Visions for the Future: Tools, Configurations and Structure-Relationship Diagrams

If we scroll through the research path we have completed, we can reconstruct its evolution: an initial technical and disciplinary analysis made it possible to prepare a “playing field”, a known terrain with respect to which to develop subsequent moves. Projects stop here more and more often, and become a flat shell of what the analysis, the cognitive framework, describes. These are possible and improvement proposals, but which lack the “transformative” value, the ability to constructively question what already exists.

The first action that triggers the “optimistic” contents of the project, corresponds to the development of the first wave of scenarios (Figure 10). It is about free and multiple, alternative and contemporary readings. An accumulation of raw material, essential to feed the next phase. The second action, the presentation of the project scenarios, instead, has the aim of producing reactions from the administrators and the community. Some scenarios attract interest, others don't. Even if this step, the decreed death of some possible futures, is part of the process, it is indeed a necessary stage to access the next phase.

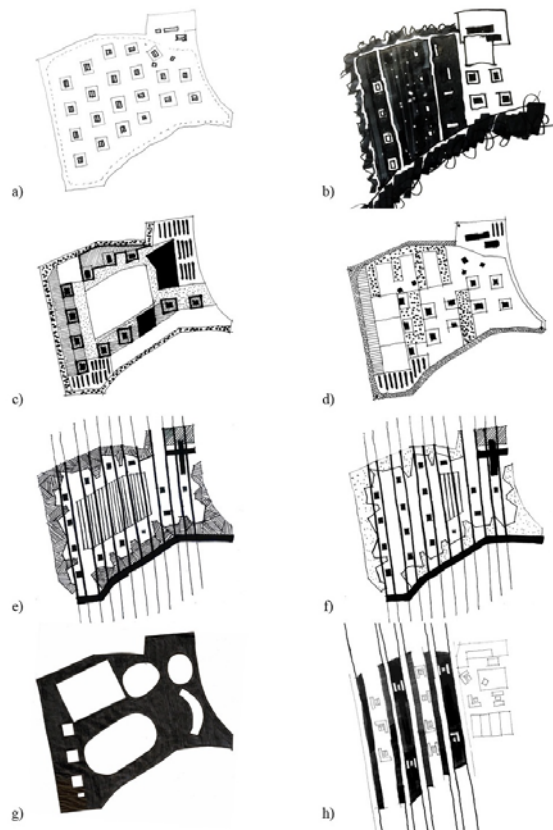


Figure 9. a) Current Status; b) - h) Structure Schemes of the 7 Alternative Scenarios

Source: Research team.

Finally, the synthesis is obtained by comparison. The invariant elements have been recognized, that is, those that are always true, in each of the possible futures. On the one hand, this last operation allows us to define the outcome of the study, the standard form from which to start the planning activity for the area of the former Romans d'Isonzo powder warehouse. On the other hand, it leaves open a series of possibilities and alternative futures.

The third step, the subject of this section, is an iteration of the first action. In evolutionary terms, it corresponds to a second generation of possible futures, obtained by crossing the “survivors” of the previous phase (Figure 11).

The outcome of this procedure is, on the one side, the recognition of the fixed elements of future transformations, the essential ones, on which to invest efforts and resources. On the other side, it is the maintenance of a wide “possibility of maneuver” that offers freedom, even in the subsequent project phases, to choose alternative development directions, without having “tied hands” by previous choices that are incongruous with the appearance of unexpected surrounding conditions or new opportunities.

The synthesis scenarios are less radical and less numerous than the initial ones. The goal is to mediate the initial hypotheses, programmatically diverging, to converge towards operational solutions capable of accommodating multiple, synergistic activities, efficient enough to sustain each other and to enhance

themselves. This “mixité” of compatible functions can also be modulated by making one prevail over the other, depending on the degree of differentiation or homogeneity that is intended to be introduced in the area.

Compared to the initial scenarios, in the summary ones, it is possible to recognize as whole or in part, some themes or specific solutions detailed in the previous phase, while others simply disappear.

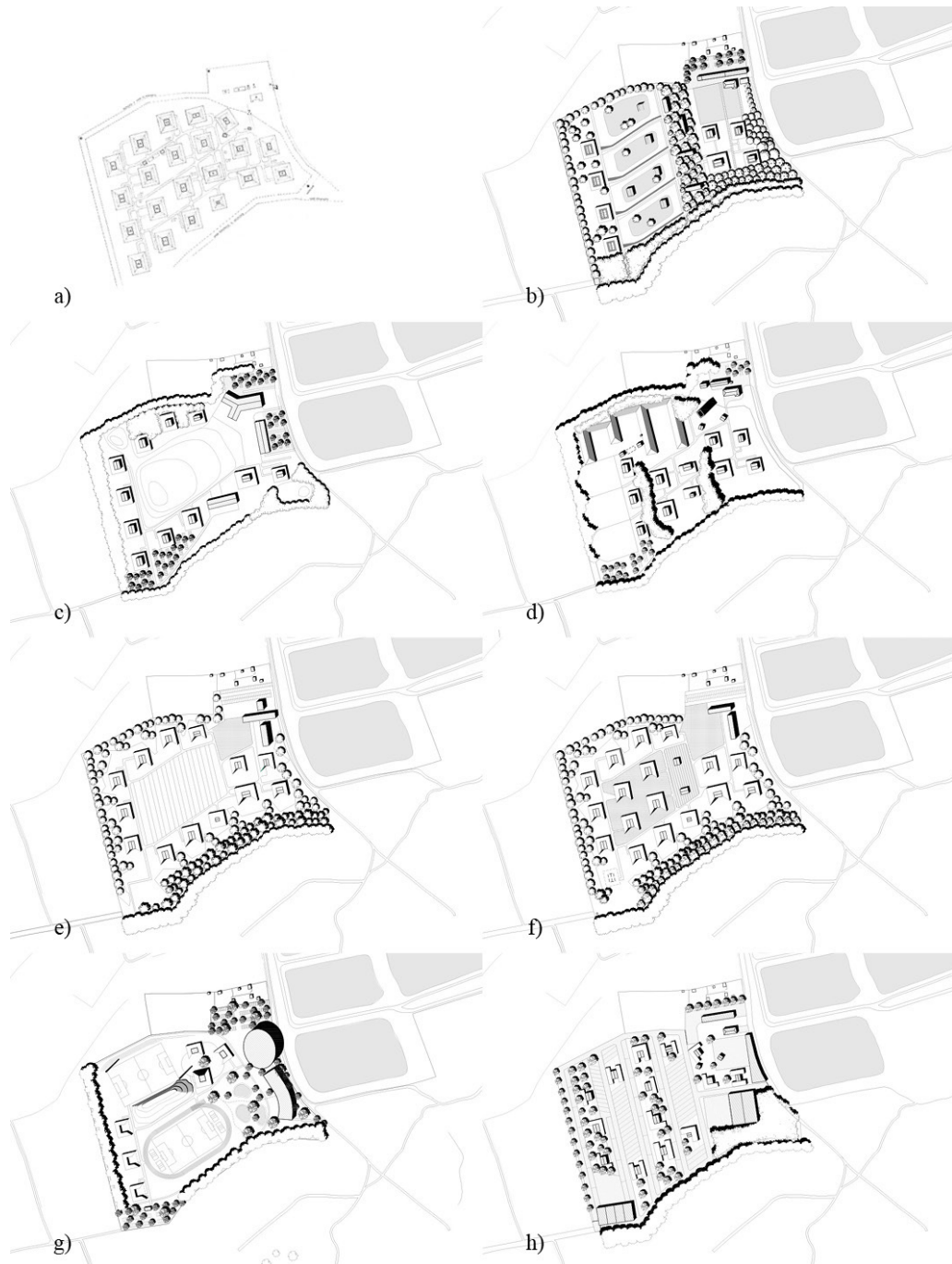


Figure 10. a) Current Status; b) - h) Project Plans of the 7 Alternative Scenarios

Source: Research team.

This rewriting and redefinition operation is the result of the intermediate participation processes, implemented between these two stages of scenarial development. The confrontation with stakeholders and the Administration, on the basis of “radical” and monothematic scenarios, in fact, allowed the community to choose some directions, or at least unequivocally discard others, taking clear and aware positions on the basis of alternative “visions”.

The synthesis of this research track, or rather what we can really define as the result of the experiment, is the “standard sheet” (Figure 12a). The standard form is the arrival point of planning by scenarios, but it is also the new starting point for the effective planning (for preliminary and executive architecture) of the individual parts that we have identified. The standard file contains all the reasons for the transformation request, the simulations, the verifications of the modification hypotheses, but it also contains all the local and territorial analyses. The traces of this path between analysis and project are “deposited” in the standards sheet.

The standards sheet is therefore the tool with which it will now be possible, starting afresh from the larger scale (urbanism), to start the planning phase (drafting of the municipal plan, Piano Paricolareggiato Comunale), that will also contain the detailed planning of the individual UMIs (minimum units of intervention) and the related “urbanization works” (green and parking standards, roads and sub-services in the network).

At first glance, the path that led to the standards sheet might seem very laborious and perhaps even too complex. However, the goal was also to test a methodology, a process. So for us, the development of the method was also a result that we put up for discussion. Moreover now, thanks to this method, the “scheme-structure”, the functional zoning and the urban layout are based on verified choices, which have also passed through the evaluation test of the “alternative and comparative solution”.

In a nutshell, it is possible to say that we have tried to do the reverse design process, compared to what would usually be done. We started from the particular (architectural scenarios) and arrived at the general (the standards sheet and the urban layout) according to a bottom-up flow. And now from the general it will be possible to return to the particular, but with more awareness.

Another aspect that we place among the results is the language of the “standards sheet”. Language that does not only concern the graphic definition, but the overall syntax, which allows its use, interpretation, and application. We have said that the “standards sheet” is like a sort of genetic code that contains all the information on the phases of the process (analysis, modeling scenarios, checks, variables, invariants, etc.), but since it is a tool, it must be “instrumentally” usable, therefore declinable in space (scope of intervention) and over time (according to the Minimum Intervention Units), while guaranteeing the protection of elements or spaces recognized as valuable, or strategic, and the right flexibility to accommodate solutions and different programs. Therefore the syntax of the “standards sheet” is played out according to a structuralist approach, of the relationship between the parts (connected or not connected) and the morpho-typological role of the parts (variable dimension or non-variable dimension). We can therefore say that this new syntax works through configurations.

But let us now retrace the salient stages of this method. The synthesis scenarios identified and developed are (Figure 11):

Scenario A

Events and Associations: an attractive area on a supra-municipal scale that wants to, however, also remain at the service of local, social and cultural activities.

Scenario B

Sports and Hospitality: informal sports activities, open to all, and more structured but not present in the municipal area, are articulated with an area dedicated to accommodation and temporary hospitality, aimed at alternative forms of tourism.

Scenario C

Naturalistic Park: a large area of environmental value, grouped according to different sub-themes: teaching, public services, which constitute a rich and complex articulation.

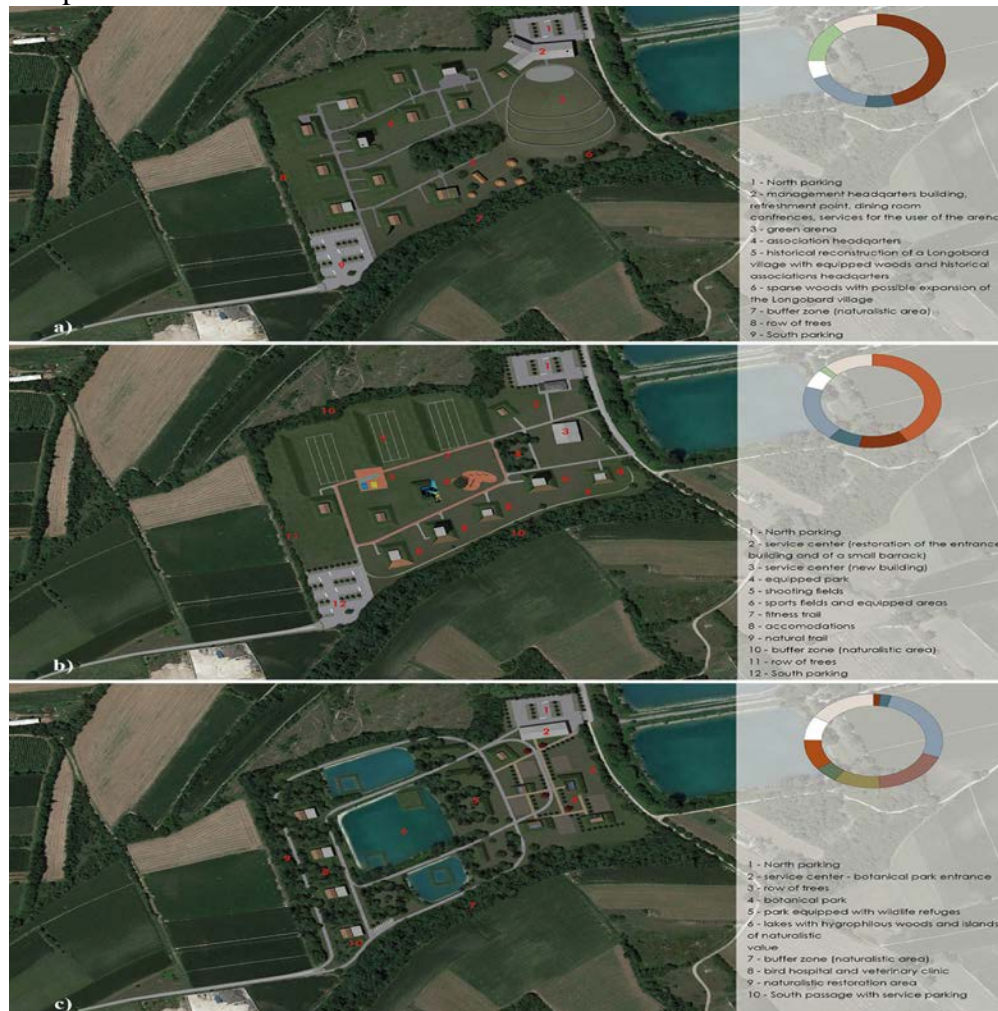


Figure 11. *Photorealistic. Scenario a), Scenario b), Scenario c) Plans with Insertion of the 3 Final Synthesis Scenarios*

Source: Research team.

Finally, the synthesis is obtained by comparison. The invariant elements have been recognized, those that are always true, in each of these three possible futures. The identified “constants” gave rise to a “standard sheet”. This content was intended to serve as a reference basis for the development of an Implementation Plan, an opening move for any concrete transformation process of the area.

The standard form (Figure 12a) identifies two “dimensions”:

1. The structural components that have the function of being “system invariants”, or components, or configurations, or prescriptive pre-dimensions for the future designs and planning;
2. Flexible components that have the function of being the “variables of the system”, or components, or configurations, or pre-dimensioning free and open to the needs of the case, to the contingencies of the moment, to the possible different natures, and origins of the demand for transformation.

At the end of this process, we also wanted to perform a final “laboratory test” to verify the functioning of the model developed, defining the standard form to the requests for transformation and reconversion of the area, which in the course of the development of the research also emerged, thanks to the research itself.

This final simulation (Figure 12b) verifies not only the result, but also the method (process) set by the research path and proposes an integrated layout with a new landscape outline and a transformation, but also recovery, of all the building heritage present on the site.

In synthesis, it is assumed that a set of public spaces with different specializations will be created, strongly characterized by the naturalistic dimension and by a thematic area that promotes local traditions, history and culture (Longobard archeological park). The reconversion project also includes the adaptation of the access roads, the construction of two public car parks to serve the entire area, and the re-naturalization of the entire perimeter (plant filter with environmental hedges, rows of trees and shrubs), with a wooded area of particular naturalistic value within the paleoalveo in the southern part of the area. This functional layout, rather than urban and architectural, arises from requests for use by local associations and individuals.

The summary configuration provides a layout consisting of 3 Minimum Intervention Units (UMI), in addition to the connected “urbanization works”: UMI 1. the public park, green areas among the former powder magazine completed by a large central area (green arena) for shows, events, demonstrations and outdoor parties.

UMI 2. the village of associations, the set of former powder magazines and surrounding spaces (detected) which will be restructured (even in different times and ways) to become the headquarters of all the associations. UMI 3. the Longobard archeological park which will propose the reconstruction of a Longobard village in which to develop educational, recreational and cultural activities linked to the historical re-enactments.

This last simulation summarizes the results obtained, the themes, the tools, the qualities and the most pertinent dimensions for the conversion of the former

Polveriera, with the aim, in addition to verifying, of showing the application of the “standard form” and therefore to be an example of declination of the “rules” for the future implementation of the area.

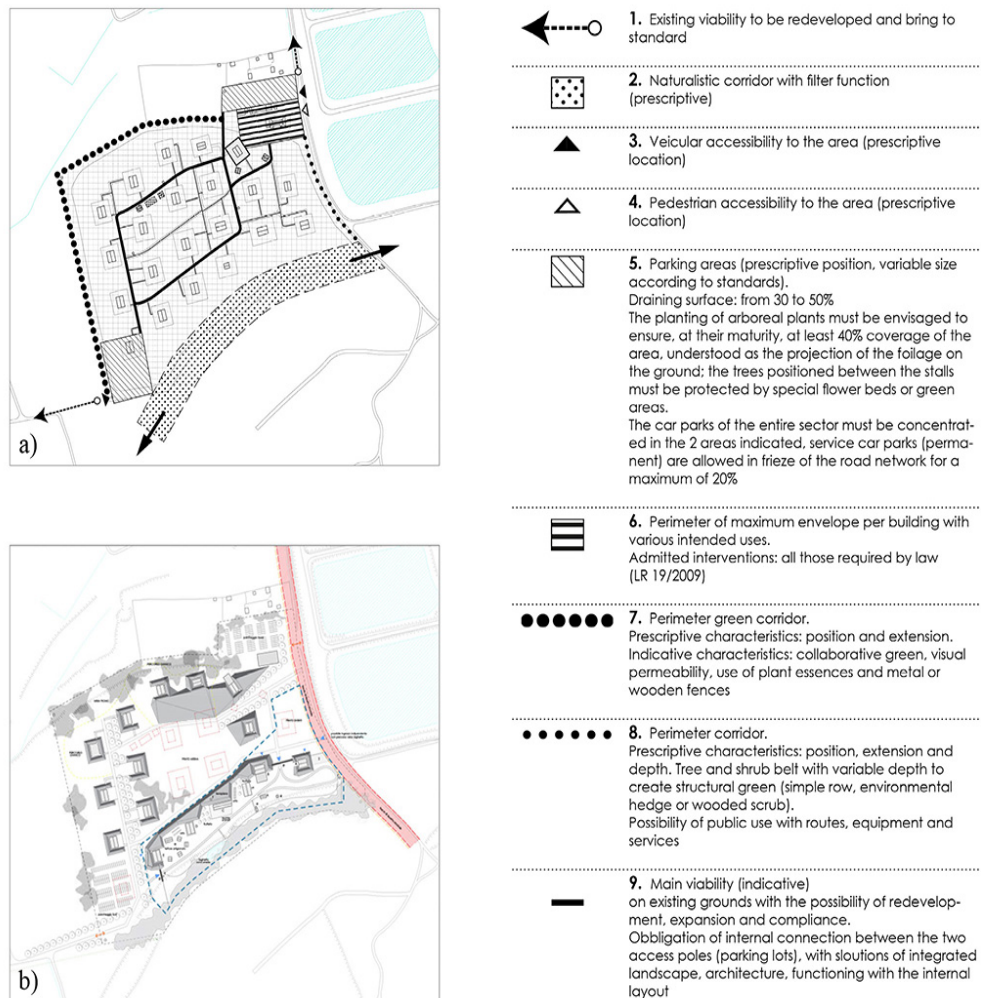


Figure 12. a) *Standard Form Result of the 7 Exploratory Scenarios and the 3 Summary Scenarios*; b) *Draft Project to Test the Validity of the Standard Form*
Source: Research team.

However, the results obtained also have a broader, methodological and disciplinary impact. The exploration of possible worlds amplifies the scope and the added value of the architectural project, intended as a privileged tool for building a better future, an innate tendency of the human being, a transformative capacity aimed at making the environment in which we live.

In the last century this attitude took on the forms of modernism and manifested itself through faith in technological progress. However, it is not a side effect of planning and building, this form of trust or even faith in the future is not a consequence, but a driving force of the discipline that pushes it to evolve, to introduce change.

More correctly, we could say that the optimist is not so much the architect, but rather that optimism is a quality of the project, that the architect must cultivate and grow. The figure of the architect-demiurge, therefore, disappears in this picture and, on the basis of his disciplinary and exclusive knowledge, expresses the design solution in a drawn form, the only one possible.

In summary, we can classify the design result obtained as a masterplan, a strategic vision destined to direct subsequent operational choices. The laboratory and operational character that this experience contains, however, defines within it a real project dimension that details and specifies the concept of masterplan. On the one hand, in fact, possible alternatives are explored, but on the other, the responsibility is assumed to condense ideas into forms.

Discussion and Conclusions - Scenario, Project and Replicable Configuration: Rule and Model

The research was articulated on different disciplinary areas (architectural, landscape, environmental, urban planning, traffic) and with different modalities (construction of the simulation, model, project, etc.) which allowed to collect and systematize heterogeneous contents and to experiment working methods and evaluation.

The study was first of all an experimental research, as it applies operational methodologies for the recovery of a disused military site on a specific case study, the former Polveriera of Romans d'Isonzo (Gorizia).

However, the study also presents a more "general" and therefore purely scientific modeling character of theoretical research, which specifically concerns the methodologies of analysis, collection, interpretation and use of territorial data (landscape, environmental, architectural), and simulation techniques and forecast for the elaboration of transformation scenarios. For these two aspects, techniques consolidated by the discipline were used and methodological experiments were carried out starting from the "simulation theories" (indicators scenarios – Figure 8, and combination of scenarios – Figures 10-11).

The research also had developments in the purely didactic field, as the contents were deepened in a "graduate laboratory", which saw the development of three final dissertations, two of which (Figures 13-14) have already been discussed⁴² and one is in progress.

Finally, the research has had and will continue to have implications in the field of scientific dissemination and the so-called "third mission", dissemination to the public.

During the work process, various public engagement activities were organized: presentations, round tables and meetings for the discussion of the steps and the progressive results. Not only to show the client the progress, but also to share it,

42. Degree thesis of: Daniela Divkovic, *Cinque Habitat per una nuova ecologia* (Università degli Studi di Trieste, catalog OPAC, 2021); Nicol Di Bella, *Progetto di riqualificazione dell'ex-Polveriera di Romans d'Isonzo* (Università degli Studi di Trieste, catalog OPAC, 2021).

and above all for feedback that can be used and integrated in the processing of the research object's own contents and develop scenarios.

In addition to these dissemination activities aimed at sharing research activities, the scientific results have already been proposed at an international conference on urban studies.

Finally, the entire body of research will, by 2022, be the subject of a specific scientific publication of an in-depth analysis and integration of the results by the working group, in which they will be reorganized, systematized and illustrated for scientific dissemination.

The methodology used in the development of this study, was used for the first time in Italy in the 1950s, by Giovanni Astengo for the development of the urban plan of Assisi. However, there are numerous and subsequent examples in Europe, such as the French Datar or the Dutch Vinex, that studied urban and territorial transformation beginning from the techniques of "construction of prediction" borrowed from the methodologies of gaming simulation, of the if-then or of the what-it used for war games, but above all for the simulation of atmospheric precipitation and the forecast of climate change in meteorology. Urban planning, landscape planning and often also landscape design use "alternative or incremental simulation" for scenarios as a forecasting and consequently evaluation tool (often as a basis for ex-ante SWOT analysis), regardless of whether they are large or small transformations, since this methodology permits the "rationalization of the complexity" in finite parts and therefore allows a "more objective" evaluation.

The path proposed to the scientific discussion was an "open" type, as was the result: building a multitude of forecasts, simulating complex processes, in some cases deliberately negative or problematic (crisis scenarios). It allows you to "look ahead" with one wider visual spectrum and then to sum up by subtraction, it allows you to visualize "what remains", what is "really structural" (the scenario invariants) and what is modifiable, flexible, and transformable. This might seem almost paradoxical because if we think in terms of the project, we should fix a layout, but in this case the attempt is to use (perhaps test) the project as a "configurational choice", as Costantino Dardi⁴³ called it.

Tackling a similar theme with the scenario also constitutes a challenge for scientific research in architectural and urban fields (especially for brownfields): tackling the construction of scenarios for such large abandoned areas, to be re-functionalized today, has meant questioning once again some of the large categories of modern thought: zoning or mixed use? Enclosed system or contextualism? Local or global strategy? necessary expansion or infill development? New urbanism or smart growth? These word pairings were discussed throughout the research development. Now, at the end of the process, it seems to us that these pairs of words can open up new research paths, starting precisely from the set of projects that build the horizon of the simulation and in particular will be understood as: exploration of trends, construction of the vision, delimitation of limits and constraints, process crisis structures, layout functionality.

43. Dardi, *Semplice Lineare Complesso. L'acquedotto di Spoleto*, 1987, 24.

From a practical point of view, all this can be directly applied to the area under study, but the method can also therefore be replicated throughout the region, given the number and extent of brownfield sites and considering the settlement and infrastructural characteristics of Friuli Venezia Giulia (Figure 8). These reconfigurations of an incremental process may be useful to the Administrations, and in particular if they are small Administrations (with reduced annual budget capacity), because they will be easily projected into long-term planning.

In the end, we can say that the construction of the simulation with the scenarios was “a game of friction” because we made the scenarios interfere (by overlapping and by increasing) the scenarios with each other, with the rules of gaming, we mixed and combined (according to various theories), the numerous images (*visions*) gradually emerged, and therefore a sort of “new horizon of reference” was built. All this has brought out (almost automatically) the represented new landscapes, has radicalized the conflict (in this extremely useful phase), and also the contradictions of the design choices (avoidable therefore in the subsequent design phases), and finally, and more importantly, has explored the extremes (limit states).

Finally, we can add to the discussion the following synthesis hypothesis: working with scenarios leads to reflect on possible compatibility and coexistence, on oppositions and differences, always allowing, in the end, to select “places and potentials”, and thus to propose visions for the future (which is different from the project) for reflection and open discussion.



Figure 13. *Experimental Design for the Case-Study. Daniela Divkovic, Degree Thesis: “Five Habitats for a New Ecology”, Supervisor Prof. Adriano Venudo, Co-Supervisor Prof. Alfredo Altobelli, University of Trieste, OPAC Catalog, 2021. Source: Daniela Divkovic.*

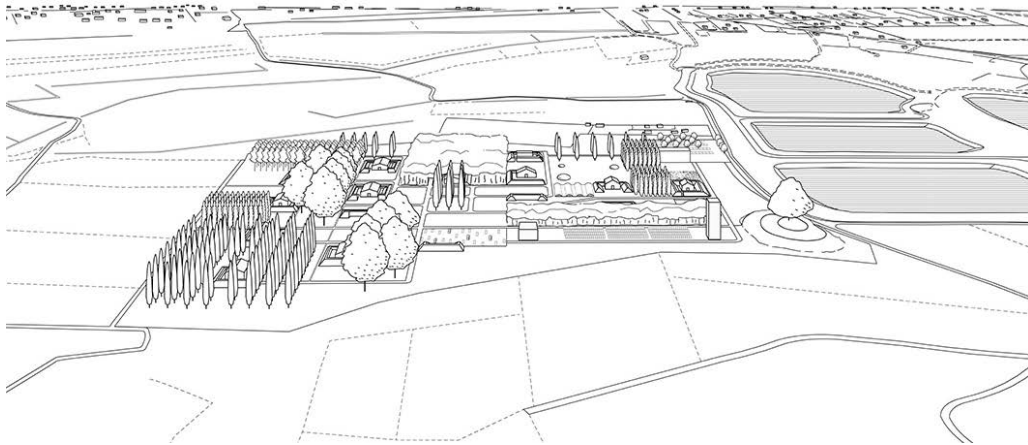


Figure 14. *Experimental Design for the Case-Study. Nicol Di Bella, Degree Thesis, "Redevelopment Project of the Former Polveriera di Romans d'Isonzo", Supervisor Prof. Adriano Venudo, Co-Supervisor Prof. Thomas Bisiani, University of Trieste, OPAC Catalog, 2021*

Source: Nicol Di Bella.

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The research group is made up of professors, researchers, and undergraduates of the University of Trieste, Department of Engineering and Architecture with different specializations, between the fields of architectural and urban design, landscape and environment, infrastructure and mobility and the territory. Research team: Adriano Venudo (scientific director), Thomas Bisiani, Luigi Di Dato, Giovanni Fraziano, Nicol Di Bella, Daniela Divkovic, Stela Guni (collaborator), Giulia Piacente (collaborator); Vittoria Umani: translation; Michele Calligaris (Mayor of the municipality of Romans d'Isonzo), Gabriella Marega (Head of the Public Works Office of the Municipality of Romans d'Isonzo).

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