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Report delle attività di ricerca

THE INDUSTRIAL DEVELOPMENT AREAS

The case of Caserta

edited by Giuseppe Guida

V:DADI PRESS

Università degli Studi della Campania *Luigi Vanvitelli*

Dipartimento di Architettura e Disegno Industriale

RR
Research activity report

THE INDUSTRIAL DEVELOPMENT AREAS

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PURE_Productive and Urban Metabolism Resources. Eco-solutions for new lands
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Consorzio per l'Area di Sviluppo Industriale di Caserta

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Table of contents

Acronyms and abbreviations

AdB	Autorità di Bacino
AGENSUD	Agenzia per il Mezzogiorno
APEA	Aree Produttive Ecologicamente Attrezzate
ARIR	Aziende a rischio di incidente rilevante
ARPAC	Agenzia Regionale Protezione Ambientale della Campania
ASI	Aree di Sviluppo Industriale
CASMEZ	Cassa per il Mezzogiorno
CLC	Corine Land Cover
CS	Contaminated Sites
CSC	Concentrazione Soglia di Contaminazione
CSR	Concentrazione Soglia di Rischio
EEA	European Environmental Agency
EI	Eco-Innovation
EIS	Eco-Innovative Solution
ESA	European Space Agencyù
GIS	Geographic Information System
IGM	Istituto Geografico Militare
LoD	Level of Detail
MATTM	Ministero dell'Ambiente e della Tutela del Territorio e del Mare
NbS	Nature-based Solution
NI	Nuclei di Industrializzazione
PIP	Piani di Insediamento Produttivo
PRG	Piano Regolatore Generale
PTCP	Piano Territoriale di Coordinamento Provinciale
PTR	Piano Territoriale Regionale
PUC	Piano Urbanistico Comunale
RIR	Rischio Incidente Rilevante

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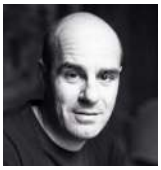

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Preface

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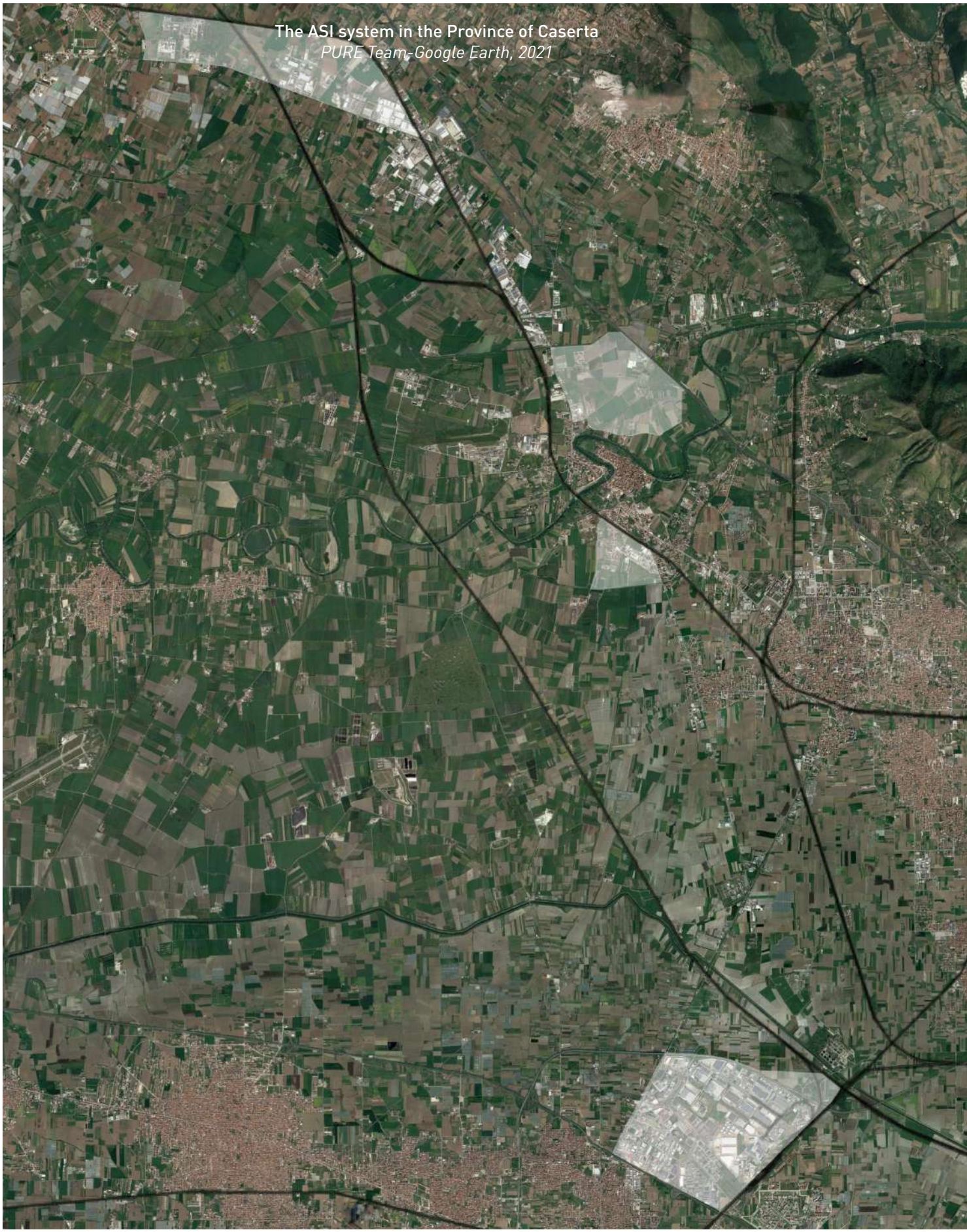
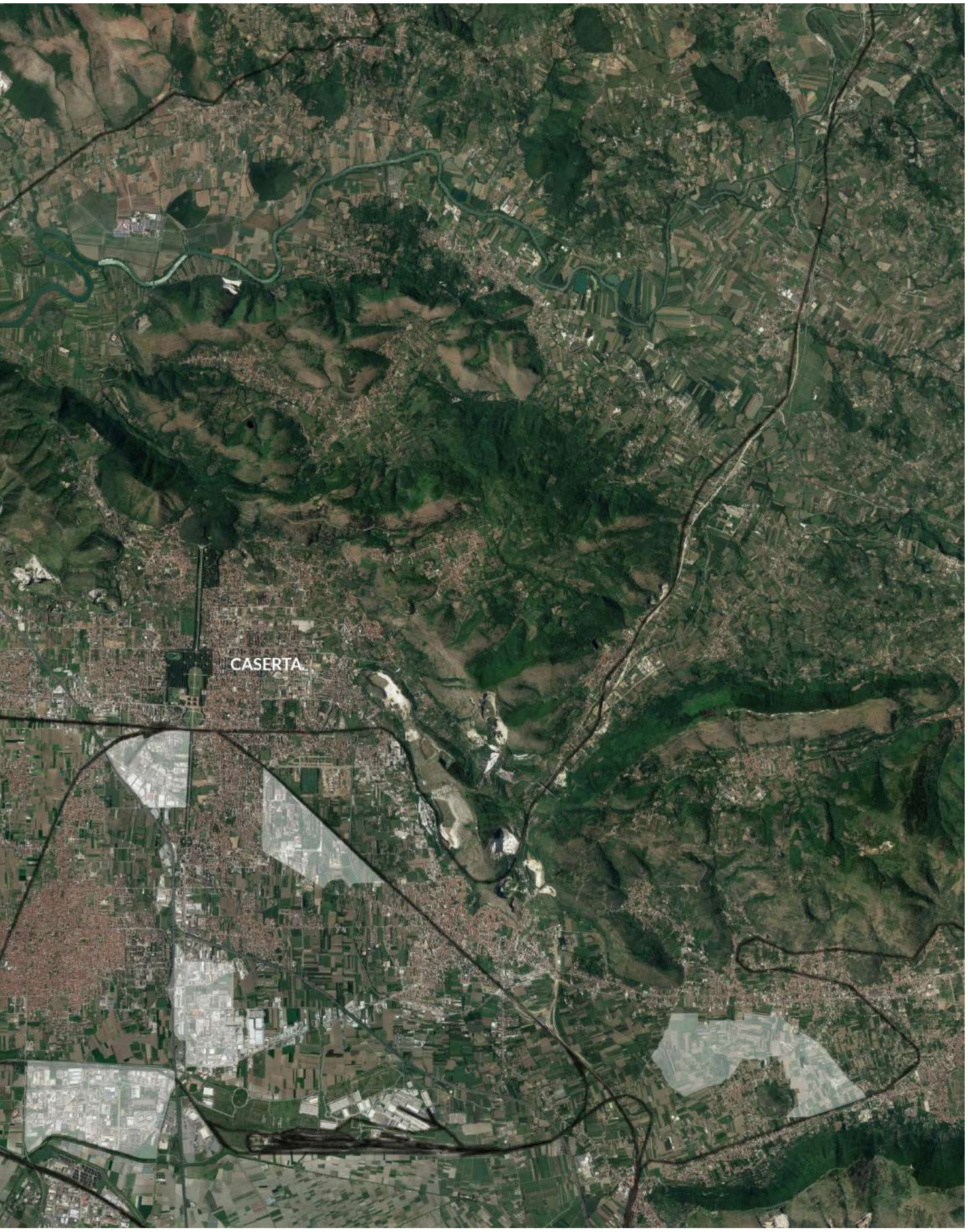
The volume presents the results of the multi-disciplinary research project PURE - Productive and Urban metabolism Resources. Eco-solutions for new lands, funded by our University with the funds of the V:ALERE project. This funding is intended to support the work of our researchers, promoting their role as principal investigators in research projects.
The PURE project, led by a research group of the Department of Architecture and Industrial Design - DADI coordinated by Giuseppe Guida, has started from some research hypotheses according to which starting from what of active or abandoned remains from the phenomenon of the Industrial Development Areas there are conditions to propose redevelopment strategies and to reinterpret their role in the territory. For the DADI research team these areas can be redesigned as containers for environmental infrastructure, urban and metropolitan equipment, slow mobility routes, even wooded areas able to coexist with the production realities still present or to be installed.
First of all, the research defines a framework of knowledge on the Industrial Development Areas, on the national policies that have promoted them and how these have been articulated in the South and in the regional territory of Campania and Caserta in particular. A specific attention has been given to the territorial planning through which those policies and development scenarios took shape on the territories. These Plans involved much of the urban culture of the time, through the direct commitment of some of its major representatives (Astengo, Beguinot, Cabianca, Radogna, Secchi, Vittorini and others). It was then elaborated a reconstruction of the complex regional and Caserta territorial system through the definition of a multi-scale system of maps populated with data, providing for each of them a reading for morphological, natural, physiographics "systems" and use of soils and buildings through synthesis and processing in GIS. Finally, scenarios have been developed that, starting from a regenerative dimension of the urban project, provide specific tools for some areas aimed at the development of urban policies and tools with the ambition to be replicable in similar situations and contexts. In this sense, the PURE project is part of some consolidated research paths on periurban territories as an opportunity to stimulate the experimentation of eco-innovative methodologies and practices useful to rethink the role of the Industrial Development Areas at different territorial scales.
The territories of disposal, abandonment and degradation, in fact, represent crucial contexts in the processes of requalification of the hybrid landscapes of the periurban area.
It is useful to remember that the PURE research was developed in collaboration with the ASI Caserta Consortium and with the Department of Territorial Planning of the Campania Region, with which DADI has signed Research Agreements. The collaboration with the ASI Consortium has made it possible to carry out an extensive archive research, encouraging the collection of plans and projects that have followed over the years and that represent the origin, but also the "memory", of what was planned and the current distance of those project intentions from the current critical conditions.
These previously unpublished maps and documents are published for the first time in this volume.
The PURE project also proposes an enhancement of the many valuable artifacts contained in industrial agglomerations such as, for example, the former Ceramica Pozzi in Sparanise designed by Figini and Pollini, or the former Kodak of Gigi Ghò, and the former factory Olivetti of Marco Zanuso and Eduardo Vittoria in Marcianise.
As well as the redesign of the infrastructure network and the provision of new green areas are an essential priority and aimed at defining new environmental and urban quality conditions. Finally, it is right to note, also in the case of this research, the fundamental role of DADI in relation to the territory where it is located.
It is a seminal role, supporting, spreading and promoting the disciplinary themes of architecture, design, restoration and urban design in a sustainable and regenerative way. DADI also carries out this task through Third mission and PCTO activities, interpreting in a civic and political sense the collaborations on the territory for training and scientific research.



The ASI system in the Province of Caserta
PURE Team-Google Earth, 2021


CASERTA

A sector of Marcianise Industrial Agglomerate and the Municipality of Marcianise
Ph Paolo De Stefano, 2020

A sector of Marcianise Industrial Agglomerate (on the left), the A1 highway (in the middle) and the "shopping mall" Campania (on the right)
Ph Paolo De Stefano, 2020

Introduction

From research questions to define a new urban

Giuseppe Guida

The territorial results of the planned industrialization of the territories and, consequently, of the geographies of the soils in the post-war period have been the subject of varied studies in the fields of politics, economics, history and urban knowledge. They have been carried out by relating the specificities of the theme with the economic and social changes of those years, and with the origin, especially in the urban field, of the planning models adopted (limiting the field of interest to the specific one of this report, some useful references can be Saraceno, 1986 - Novacco,1995 - Viesti, 2003 - Lepore, 2011 - Broccoli, 2019. In regards to economic and political analysis Guiducci, 1965 - Radogna, 1965 - Vittorini, 1971 - Belli, 1996 - Salzano, 1998 can be used properly for urban-territorial studies. Finally, for a historical reading of the phenomenon Dattomo, 2011 - Parisi, 2011 - Adorno, 2015 - Formato, 2015 - Castanò, 2012 are useful). This is a multidisciplinary reflection that, viewed from the perspective of the planning of contemporary territories and critical economic and social issues, offers a framework in which it is possible to provide an unprecedented reading that is also precise and technically relevant, while being aimed at rethinking the generative elements of the urban project for these territorial areas.

PURE is an interdisciplinary research project, carried out by the University of Campania[1], aimed at reading the industrial phenomenon set in motion by specific policies from the 1960s for the South of Italy, with the changes, often unexpected and unpredictable, caused by this phenomenon on territorial arrangements up to a description of current conditions and a possible methodological form for regenerative design practices. The focus of the research is on the great intervention of the industrial development area of the province of Caserta, in Campania.

The research provided the opportunity, still innovative, to re-read the territories, bringing out the kaleidoscope of conditions that are so far partly unknown. To emphasize the original intentions of the policies and plans developed in the post-war period and the present condition is usefulto define a field of mediation between production, regional policies, environmental regeneration and spatial adequacy (Formato, 2015), while proposing eco-innovative strategies. The story of a territory has slowly generated both a new topology as well as a new geography, cognitive facts without which plans remain in their vagueness and ineffectiveness. Today those territorial plans initially analyzed by Paolo Radogna in 1965, in Issue 45 (Radogna, 1965) of the important Italian magazine Urbanistica during their genesis (with a subsequent analysis by Marcello Vittorini in number 57 (Vittorini, 1971) of the same magazine, which highlighted a first "imbalance" generated by those industrial policies), are now "fossils of the contemporary", which foretold of a future never truly fulfilled and deposited on the great plain of Campania Felix as "real facts", "unfinished facts" (determined by the absence of adequate public direction) and, finally, imaginary facts (only traced on the maps of the town development plans and programs). These are converging elements in defining the territorial "palimpsest" (Corbot, 1985) that emerges from the general crisis of these territories and this research, with the partial view of urbanism, tries to reread so as to rethink the future. The following text first traces the question of the planned industrialization of Southern Italy, comparing it with similar international experiences and focusing on the area of the province of Caserta.

The industrial dimension and the genesis of a New urban

The Industrial Development Areas (in Italian Aree di Sviluppo Industriale - ASI) were established with the Law n. 634 of 1957 with the objective to heal the imbalance in the distribution of the national industry, through measures to support new industrial settlements «for poles» in the South. This operation was managed and financed by the Cassa per il Mezzogiorno and preceded by a «pre-industrialization» phase, in which the action of the Cassa was dictated by the cogency of the agricultural question and unfolded through a first transformation and infrastructuring of the South.

This operation was managed and financed by the Cassa per il Mezzogiorno and preceded by a «pre-industrialization» phase, in which the action of

the Cassa was dictated by the cogency of the agricultural question and unfolded through a first transformation and infrastructuring of the South.
The ASI were implanted, also following the indications of the Circulars following Law 634/57, according to special Regulatory Plans. These plans were given the status of a Territorial Plan of Coordination, therefore the municipal plans were subordinate to it, in general, without a real coordination of their forecasts. Currently, the governance of the ASI is entrusted to appropriate Consortia, (participated by municipalities, provinces, chambers of commerce and other interested bodies) that regulate the operation and draft the ASI Plans. From the morphological point of view, each ASI, whose localization was previewed in contexts 'particularly qualified, is composed of various areas called Agglomerates.
Within each Agglomeration, in addition to services and production, logistic and trade infrastructure, were provided areas for public services, equipped and green spaces and, standard to be integrated with urban areas to which they were connected. In the territories with less predisposition to the presence of industry were allowed settlements of smaller size, called Industrial Units (in Italian Nuclei Industriali - NI) of a widespread nature, and in many cases causing the decadence of the concentration and polarization logic contained in the founding law. The assumption was that, at the industrial sites «the existence and multiplication of agglomeration factors would give their industrial development an autocumulative trend» and, that is, would trigger further induced in a sort of artificial development of the industry supported by an adequate infrastructure guaranteed, precisely, by the Consortia and the Cassa del Mezzogiorno. Between 1957 and 1960, 3 ASI and 1 Industrial Unit were established, but over the next ten years a further 14 ASI areas and 28 Industrial Units were established, with a rapid spread that affected the whole of Southern Italy. According to some calculations, this covered about 20% of the entire territory (Vittorini, 1971; Adorno, 2015) (Fig.1).
From the point of view of the territorial planning, the Industrial Development Area of Caserta (whose historical-political events have been covered in the previous chapter) (Fig.2). responded to a macro-regional logic and from the point of view of the planning of large area fit, together with that of Naples, in two of the different development scenarios that in those years were delineating (often the documents and policies of that period, related to the economic development of the South, overlapped and in some cases, conflicted).
The first is the Economic Development Programme Project 1965-1969 which, in the chapter on territorial aspects, proposed a model of spatial structure consisting of the axis Latina-Caserta-Naples-Salerno, symmetrical to the Adriatic axis Bari-Brindisi-Taranto.
This axis of development that placed at the two extremes Latina and Salerno sees the area of Caserta as a barycentric and junction of flows from Lazio, both towards Naples, both towards Irpinia and Beneventano. Starting from

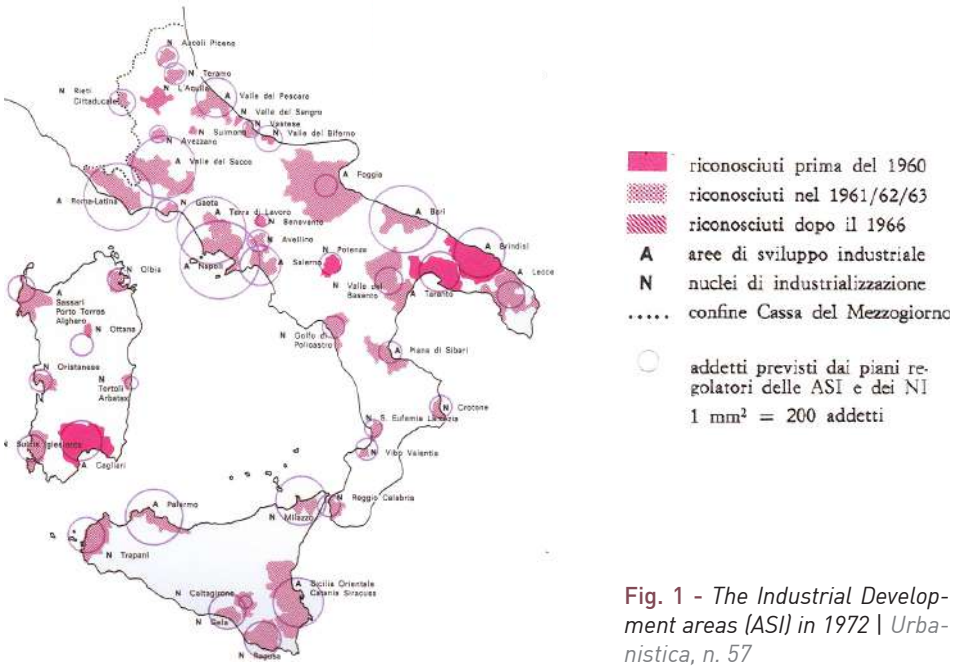


Fig. 1 - *The Industrial Development areas (ASI) in 1972* | *Urbanistica, n. 57*

Municipality of Marcianise and a sector of the Industrial Agglomerate | *Ph Paolo De Stefano, 2020*

In foreground the Outlet "La Reggia" and on the left a sector of the Industrial Agglomerate | *Ph Paolo De Stefano, 2020*

these premises, the plan for the ASI Caserta, prepared as already said by Tekne, originally proposes a linear structure between Sparanise to the north and Aversa and Caserta to the south.
This route, according to the plan, served to avoid the welding between the province of Naples and that of Caserta, calling to the north the industrial settlements (Belli and Pasca, 1968).
The second frame of reference for the industrialization of the area between Caserta and Naples is the Scheme of District Plan elaborated by the so-called Piccinato's Commission in '63 (besides Luigi Piccinato, were part of it Luigi Cosenza and Amedeo Bordiga). Both plans of Naples and Caserta derive from a simplification of the Schema Comprensoriale adopting only the infrastructural forecasts and those relative to the industrial settlements (Formato, 2015).
In summary, and beyond complex events and often not homogeneous, the plan drawn up for the ASI of Caserta, although only partially implemented, is a proof (almost a "fossil" of modernity that wanted to represent), a discipline, urban planning, that did not shirk its tasks and claimed, in particular in comparison with economists and jurists, its role in Italy's recovery (De Biase, 2021).
In general, the implementation timing, however, did not match the changes in the economic fordists and post-fordists processes, with the actual realization of the ambitious program of 'heavy' industrialization in the south being delayed when the metamorphosis of the productive system, delocalization in areas with cheap labour, and the disposal processes had already been put into motion.
To this partial failure, already in essence in the operation, in the decades to follow spontaneous or planned urban transformations were induced thanks to the infrastructures built by and for the ASI, which have contributed to the urban disorder of a large part of the area.
The coordination between the ASI plans and the municipal ones has almost never happened, creating "fractures" in the territories, contributing to separate the industrial plates from the urban and rural contexts, creating industrial enclaves, also from the administrative point of view.
The result was an extensive mosaic of different territorial realities that, in particular in Caserta, defined a particular type of peri-urban area, with clear agricultural, urban, industrial and "operative" components[2] (Allen, 2003; Berger, 2006; Brenner, 2014).
A sort of "new-urban", was linked to the industrial phenomenon but which has then self-reproduced and preserved autonomously (Guida, Bello and Vittiglio, 2021). A dimension, both qualitative and quantitative, profoundly different from suburban and peri-urban phenomena, linked, for example, in the United States, to the great cyclical crises of economy and industry (Beauregard, 2006).
The productive-industrial dimension, to be injected into the territories to reinvent their identity and project them as greater economic security towards the future, was a complex action that had different origins. In the urban environment and economic disciplines of those years, there were numerous experiences of "industrial concentration" in the international context that represented models of spatial planning and organization of industries on a regional scale.
It is worth mentioning those of the Central Manufacturing Districts of Chicago and Los Angeles as well as those which are today the "underutilized industrial district" of Detroit, in the USA, the English ones of Port Sunlight, New Earswick, Letchworth, Welwyn, the German ones of the Ruhr basin or the Wolkswagen complex in Wolfburg as well as those of the great Russian interventions of Elektronowos, Leninakan (today Gyumri) and Magnitogorsk (Parisi, 2011).
In Italy, from the point of view of design, in the absence of a consolidated experience, the technical-operational references were constituted by the manuals, such as the text by Frederick Gibbert, Town Design or The Architect's Manual, published in Italy by the National Research Council and edited by Mario Ridolfi, Mario Fiorentino, Bruno Zevi, Cino Calcaprina and Aldo Cardelli in 1946 or the book by Giorgio Rigotti, Urban planning. The technique, published in 1947.
This transfer/adaptation of experiences and techniques already consolidated elsewhere found, in the urban culture, further references "justifying" in the pioneering models rationalists and proto-rationalists, who identified themselves in the attempts to overcome the urban, hygienic and functional crisis of the second industrial revolution. This was from the cité industrielle of Tony Garnier of the early 1900s, to the cité linéaire industrielle of Le Corbusier of the immediate postwar period, passing through the new urban and suburban dimension imagined by Wright in his Broadacre City of 1932, in which mobility, in the broad dimension of the prairie, was entrusted to individual transport and car mobility.
This vision is today apparently anach-

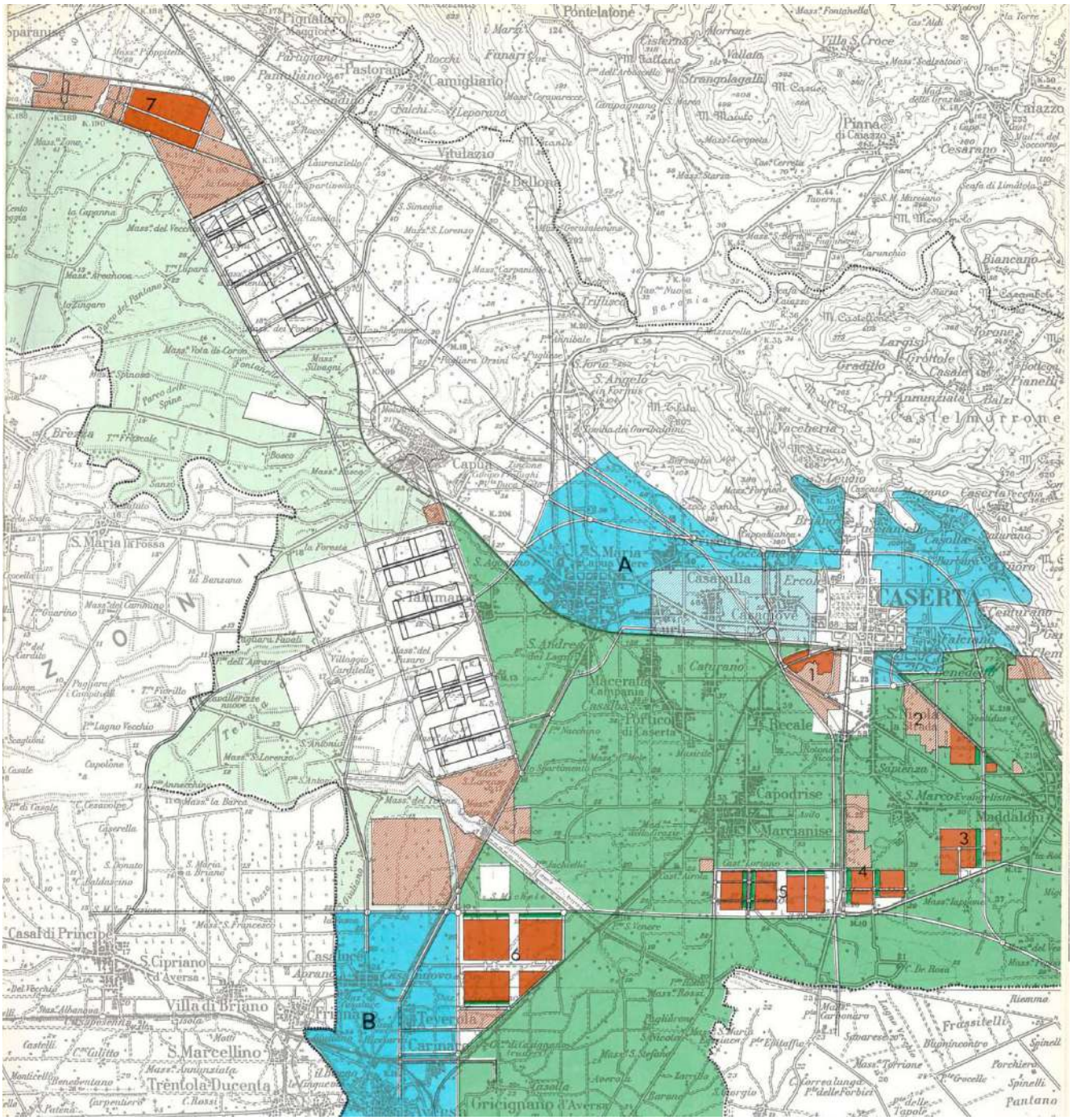


Fig. 2 - *Plan for the industrial development areas (ASI) of Caserta_Teknè SpA _Umberto Dragone, Roberto Guiducci, Paolo Radogna* | *Urbanistica, n. 45, 1965*

ronistic but that, in fact, persists in the areas under study in this report. In spite of this theoretical-disciplinary support, made right also by the policies that regulated the hetero-directed industrialization of the South, the facts told a different story. This is evident not only from the point of view of the time lag and the delay with which this idea was implemented, while elsewhere it was already looking at the post-industrial dimension, but also from the point of view of the territorial forms generated. Forms with which today it is necessary to confront, proposing supported eco-strategies, of integration between functions (urban, industrial, rural), beginning from the "fossils" of the production, and from the unfinished plans. Considering these unfinished shapes, it is worth starting from the case of Caserta. In topological terms, the region[3] (Soja, 2000), which embraced the urban-territorial plan devised by engeneering company Teknè (Guiducci, 1967) (Fig. 3) has gradually changed into a mixtre that could be metaphorically identified with the image of oil poured into water: a combination of territorial facts indifferent to each other even when they come into contact.

This figure of the "oil city" is not only the result of the industrial plates planned by the Cassa per il Mezzogiorno (for ASI Caserta today there are 14), some of which are not at all or only partially settled, but also the establishment of a multiplicity of bodies, equipment, infrastructures through sectoral logic and without coordination : from operational objects for the management of waste flows, or those serving the building cycle, from further plates dedicated to production (PIP areas of the urban plans of individual municipalities), to large hubs for trade (Centro Commerciale Campania, Outlet La Reggia in Marcianise, South Europe Interport), from the anonymous new residential expansion areas to real gated communities (such as the United States Naval Lodge of Gricignano D'Aversa) up to monads like the goldsmith complex "Oromare", close the industrial ASI agglomeration of Marcianise or the ancient complex of "La Maddalena" in Aversa or clusters in disposal within the urban fabric as the former Siemens in Marcianise, the former Tabacchificio in Sparanise, Texas Instruments in Aversa, MACRICO in Caserta. To follow the elementary topology breakdown proposed by David Grahame Shane (Shane, 2005), this territory can be synthesized in terms of "enclaves" and "armatures".

The enclaves, that we could identify, in the specific case, with production, urbanity, rural and drosscapes (Brenner, 2014) are not only indifferent to each other (even when a plan, as in the case of ASI, should have taken care of integration), but they contend the soil, compete on the edges and in the wedges in between, and all three these enclaves use the same structure: road axes, railway networks, commercial and entertainment attractors, the plot of the centuration, the historical centers, central cities for services of higher rank (Naples, Caserta, Aversa).

Lands today demand an adequate interpretation and a common strategy that gradually can trace a new identity. The coordination between the ASI plans and the municipal ones has almost never happened, creating "fractures" in the territories, contributing to the separation of the industrial plates from the urban and rural contexts, creating industrial enclaves from the administrative point of view. This is a condition that has progressively worsened with the crisis and the closure of many activities since the 1990s. Today, several agglomerations are in a state of partial or total crisis.

Some agglomerations have been identified by the plans and never realized, or subdivided only in a small part. Many areas are in a phase of decommissioning and public works, and the equipment are not realized or not usable. The relative plans were definitively approved approximately ten years after the law of 1957 (those of the ASI of Naples and Caserta, for example, were approved with the DPCM of 1968[4]), while the relative Consortia, which had materially drafted the plans, had been instituted in 1962. From the 80s onwards, environmental issues and factors related to risk, pollution and uncontrolled consumption of resources (water, electricity, soil) came into play. The water resource, for example, was localized and quantified, the best harvesting and distribution techniques were studied, always with a view to intensive use, also through desalination and recycling and extraction techniques from groundwater and running water.

The soil was instead perimeter and zoning through often oversized development projections, while the studies around its protection and hydrogeological safety remained weak. Currently, the ASI and the industrial agglomerations that make them up demand regenerative processes that, starting from the condition of marginality and abandonment in which most of them are located, reinterpret them as new parts of the nearby cities, which are starting points for ecological operations, the integration of newly developed equipment, services, production

activities and residential areas.

Research premises, objectives and questions

The research is part of the complex field of territorial studies and, in particular, of some consolidated analysis and project paths of peri-urban territories, as an opportunity to experiment with innovative methodologies and practices to rethink the role of industrial areas at different territorial scales. The areas of disposing, abandonment and degradation, in fact, represent crucial contexts in the processes of urban and peri-urban renewal focused on the consumption of "zero" soil and regenerative approach to cities (Cole, 2012; Girardet, 2015; Newmann, 2017; Galderisi and Guida, 2020). The research, in particular, is focusing, in line with the PURE research proposal, on the context of Caserta, in collaboration with the Consortium ASI Caserta and the Department of Territorial Planning of the Campania Region, establishing in advance criteria for the typological definition and characterisation of soils, buildings and their condition of use. The redefinition of interpretative parameters to read and understand the complexity of these territories makes use of the support of multiscale and implementable maps, aimed at the construction of reuse practices for their recovery in a circular and sustainable perspective. The interdisciplinary approach underlying the research, together with the use of models related to environmental and geographical sciences, is oriented to the integration of design strategies with issues related to urban planning, techniques and nature-based technologies on environmental and ecological requalification. The main objective is therefore to hypothesize a reversal of course that, starting from latent conditions of the marginal contexts investigated, reinterprets the large abandoned and "waiting" areas (industrial and not) placing them in a circular perspective. In this sense, the recovery and reuse of land, the enhancement of sometimes valuable artifacts, the rethinking of the infrastructure network and the provision of new green areas or the upgrading of existing ones, are essential priorities and aimed at defining new environmental and urban quality conditions. The experimental model and the operational approach of the research project provides an opportunity to rethink the relationship between the ASI Caserta and neighboring urban areas, activating innovative paths of mutual adaptation, while increasing ecosystem services and providing support for the creation of innovative clusters on the model of Ecologically Equipped Production Areas (in Italian Aree Produttive Ecologicamente Attrezzate - APEA).

The proposed approach assumes eco-innovative solutions, with strong attention to the relations between them and the neighboring urban centers, the integration of ecological corridors currently interrupted and the provision of public spaces and equipment. In view of the proposed circular approach, research focuses on the reduction of waste flows through these "suspended" areas, in particular construction and demolition waste, and solutions to stem the disproportionate consumption of non-renewable resources with assessment of the impacts resulting from the interaction between human and natural environments for the reconfiguration of these fragile ecosystems in terms of rebalancing and methods aimed at implement it.

Therefore, the research objectives are attributable to the following two points:

• provide a methodology for the analysis, classification and mapping of abandoned or underused areas, with particular reference to industrial areas;

• define a catalogue of eco-solutions for regeneration and guidelines to improve the integration of industrial districts with urban contexts, through new equipment and new public space.

The operational research process starting from some questions:

• What is the extent of this territorial reality?

• What type of alterations have they caused to the pre-existing territorial conditions and what problems do they present?

• What is the relationship between the area still active within the agglomerations, abandoned and disused industrial clusters, urbanised areas and rural areas still active?

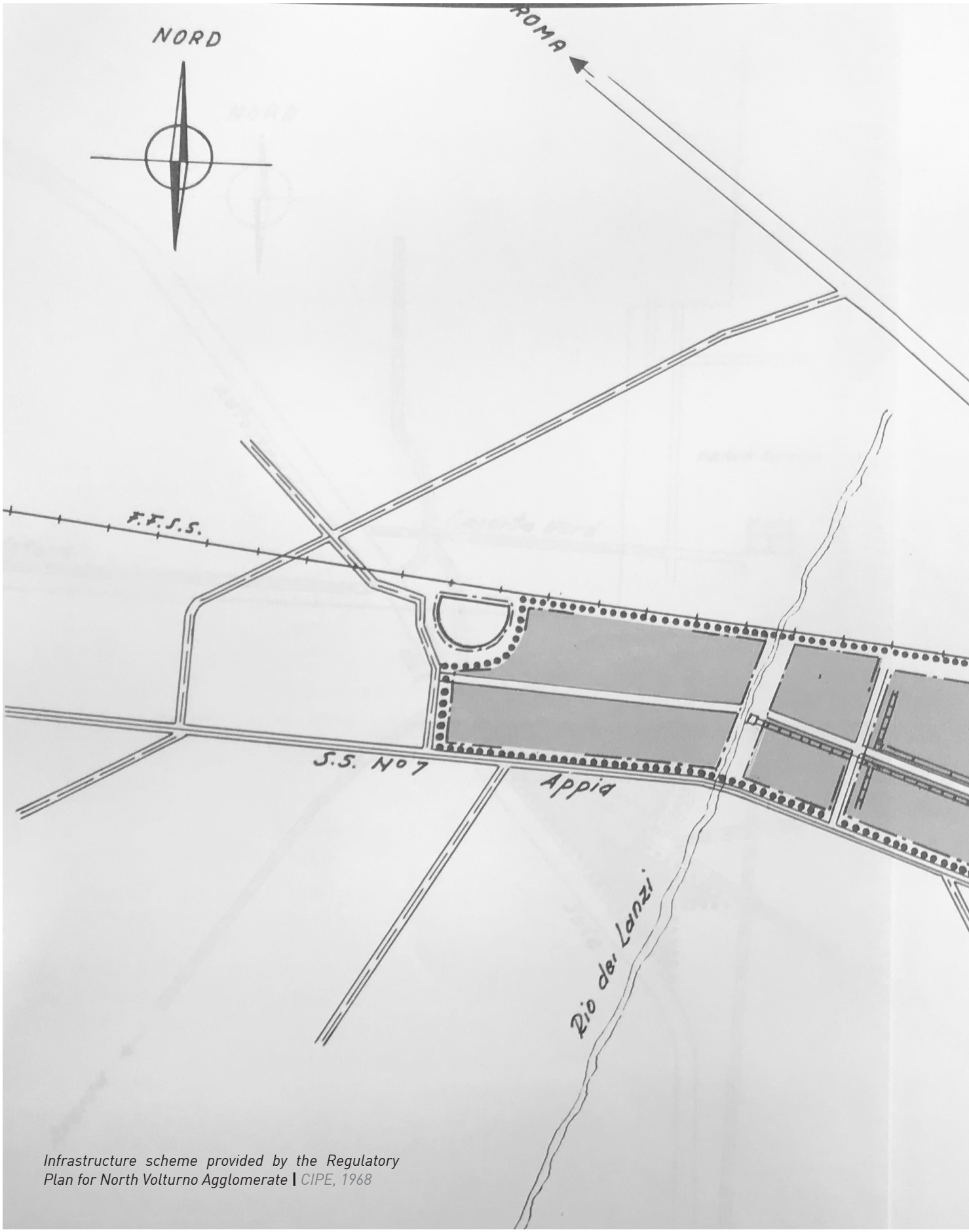
• Which models and approaches could be useful for a re-interpretation of this mosaic in a regenerative key and with which innovative models of governance?

The research activities have been, therefore, implemented beginning from the definition of actions and activities aimed to articulate place-based and reproducible eco-solutions (beginning from the definition of a framework of reference, Fig.4). The first action and related activities concerns the analysis and study of the conditions that have contributed to delineate the complex and critical territorial conditions. The process of collecting data, reconnaissance of maps

3


legenda
A13
A17
A18
A19
A22
A25
A26
A27
A29
A30
A31
B
C
D
H
M
Santa Maria

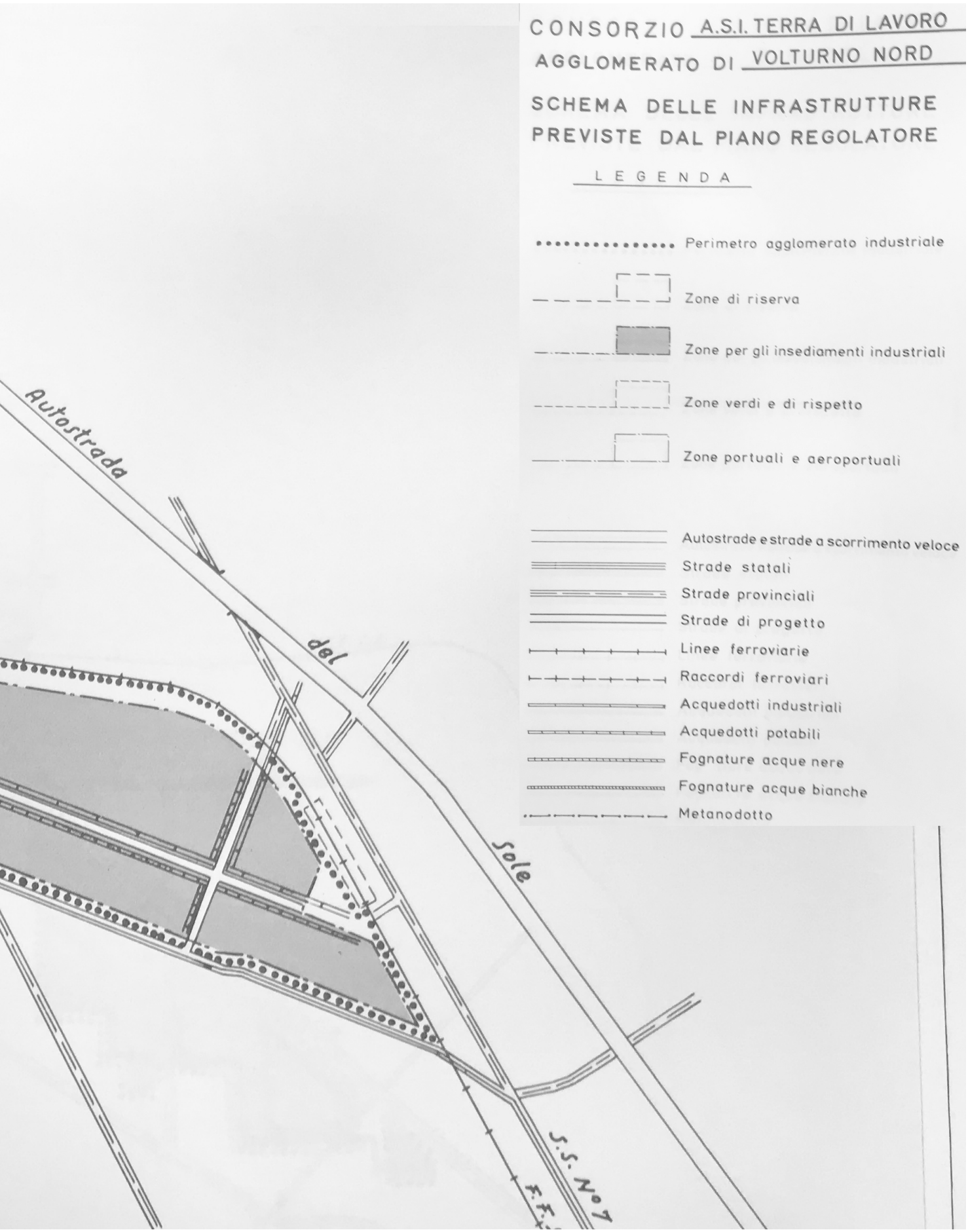
Fig. 3 - *Regulatory Plan of the Industrial Development Area of Terra di Lavoro - Teknè SpA, Milan (Umberto Dragone, Roberto Guiducci, Paolo Radogna)* | *ASI Caserta Archive, 1967*

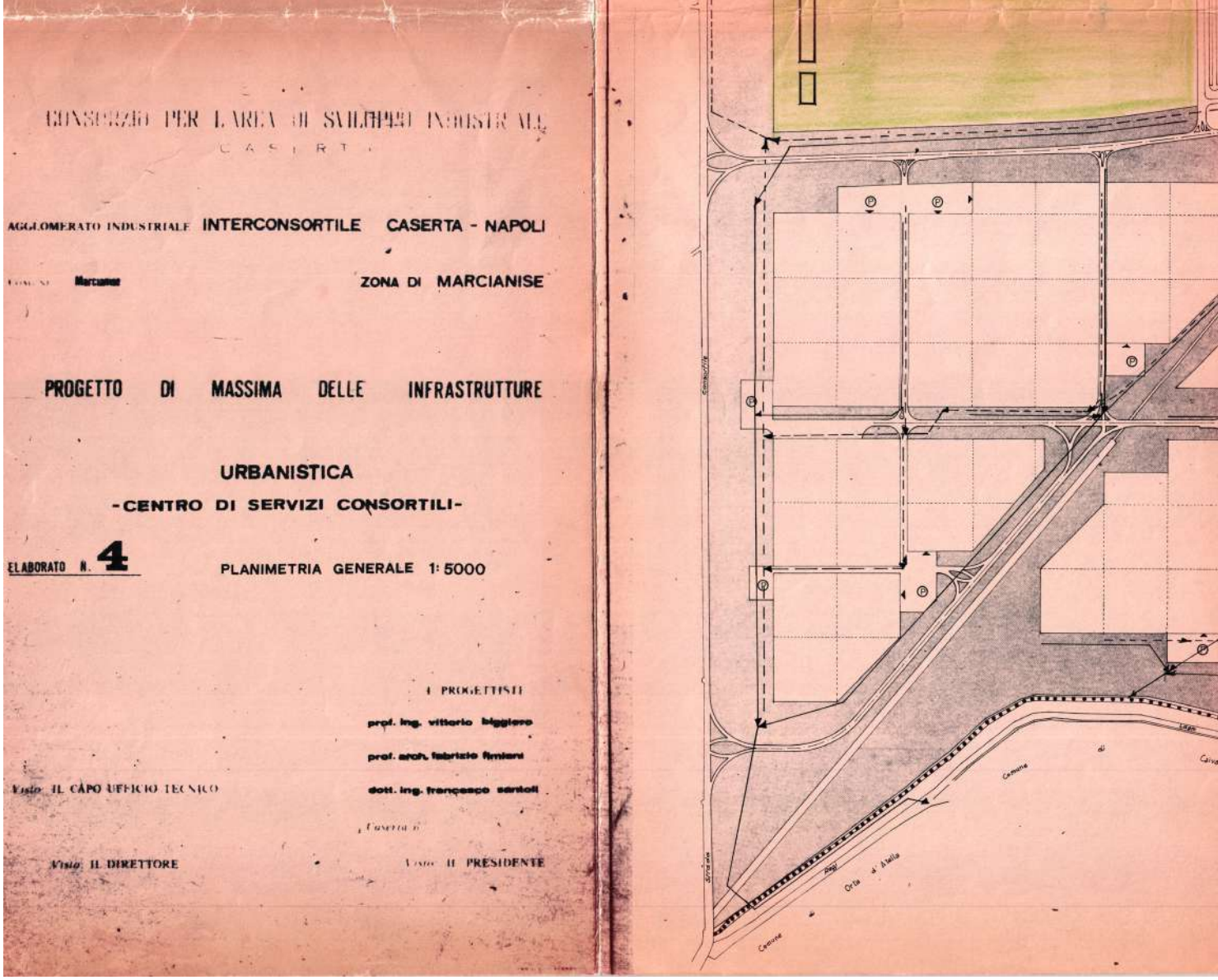


Infrastructure scheme provided by the Regulatory Plan for North Volturno Agglomerate | *CIPE, 1968*

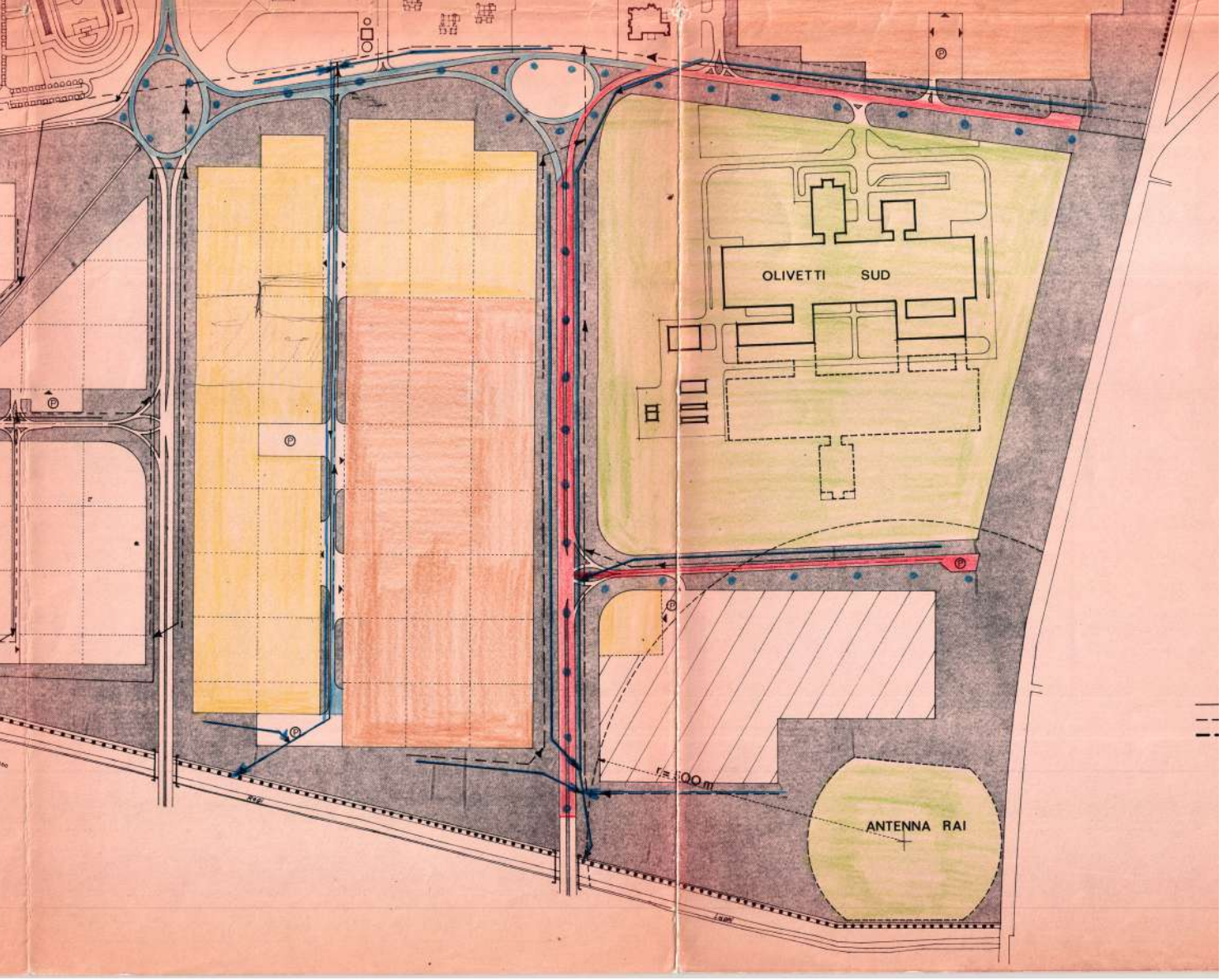
CONSORZIO A.S.I. TERRA DI LAVORO
AGGLOMERATO DI VOLTURNO NORD

SCHEMA DELLE INFRASTRUTTURE PREVISTE DAL PIANO REGOLATORE





Preliminary infrastructures project for the Industrial Agglomerate of Marcianise (Vittorio Biggiero, Fabrizio Fimiani, Francesco Santoli) | *ASI Caserta Archive, around 1970*



SIMBOLOGIA

INSEDIAMENTI INDUSTRIALI

OPERANTI

IN COSTRUZIONE

IN ASSEGNAZIONE

OPERE INFRASTRUTTURALI

REALIZZATE O IN CORSO DI REALIZZAZIONE

PROGETTATE E DI URGENTE FINANZIAMENTO

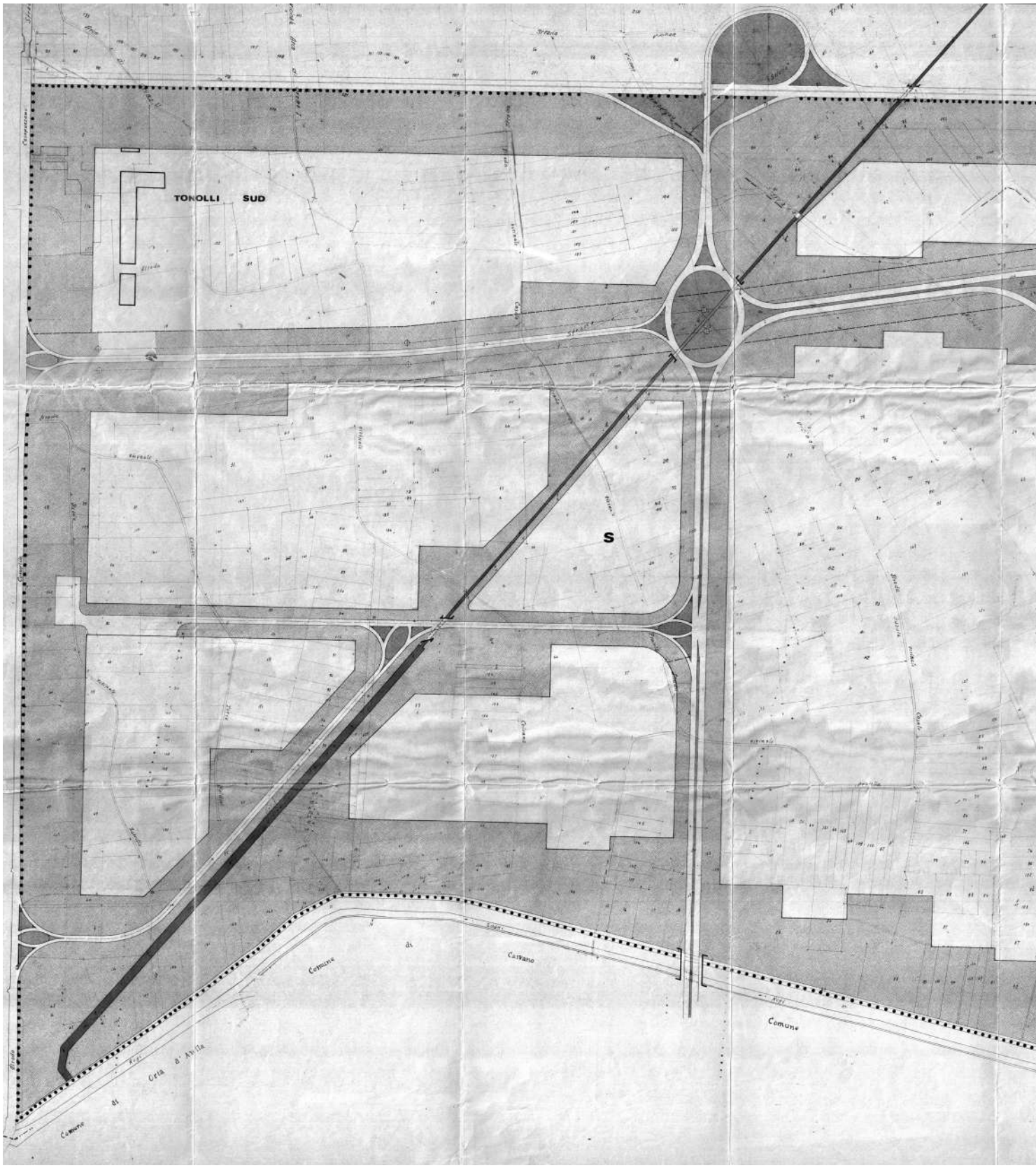
- Opere stradali stralcio Centrale L. 299.000.000
- Opere Fognarie Comparto Orientale-Rete pluviale- L. 200.000.000
- Opere di Illuminazione I° Stralcio L. 100.000.000

LEGENDA

RETE PLUVIALE

" HERA

COLLETTORE CONSORTILE ACQUE HERA



Variants of the Teknè regulatory plan for the Marcianise Industrial Agglomerate | *ASI Caserta Archive, 1971.*

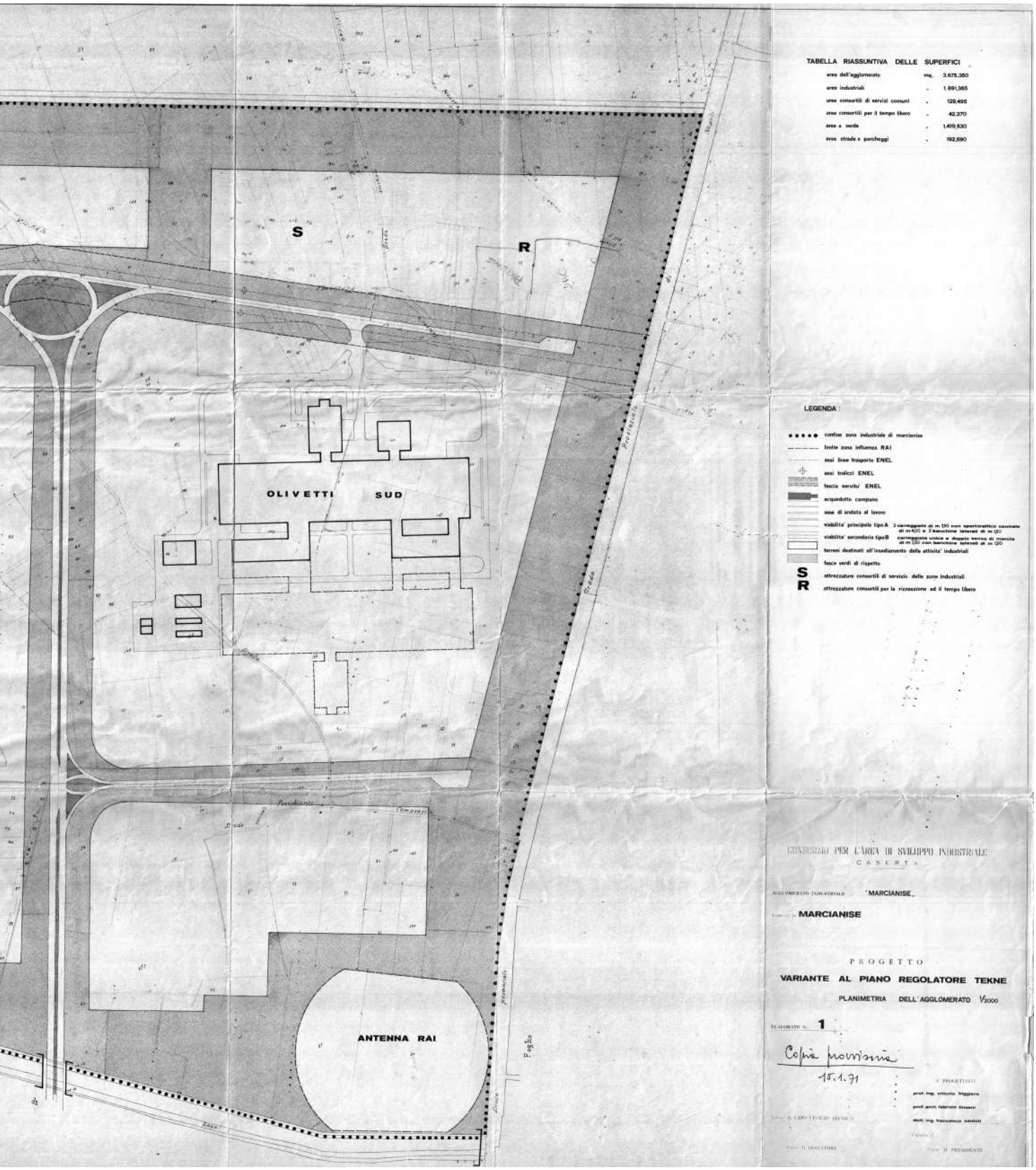


TABELLA RIASSUNTIVA DELLE SUPERFICI

area dell'agglomerato	mq.	3.675.350
aree industriali	"	1.891.365
aree consortili di servizi comuni	"	129.495
aree consortili per il tempo libero	"	42.370
aree a verde	"	1.419.530
aree strade e parcheggi	"	192.590

LEGENDA :

- confine zona industriale di marcianise
- limite zona influenza RAI
- assi linee trasporto ENEL
- assi tralicci ENEL
- fascia servitu' ENEL
- acquedotto campano
- asse di andata al lavoro
- viabilita' principale tipo A — 2 carreggiate di m 7,50 con spartitraffico centrale di m 4,00 e 2 banchine laterali di m 1,50
- viabilita' secondaria tipo B — carreggiata unica a doppio senso di marcia di m 7,50 con banchine laterali di m 1,50
- terreni destinati all'insediamento delle attivita' industriali
- fasce verdi di rispetto
- S — attrezzature consortili di servizio delle zone industriali
- R — attrezzature consortili per la ricreazione ed il tempo libero

CONSORZIO PER L'AREA DI SVILUPPO INDUSTRIALE
CASERTA

AGGLOMERATO INDUSTRIALE "MARCIANISE"

COMUNE DI **MARCIANISE**

PROGETTO

VARIANTE AL PIANO REGOLATORE TEKNE

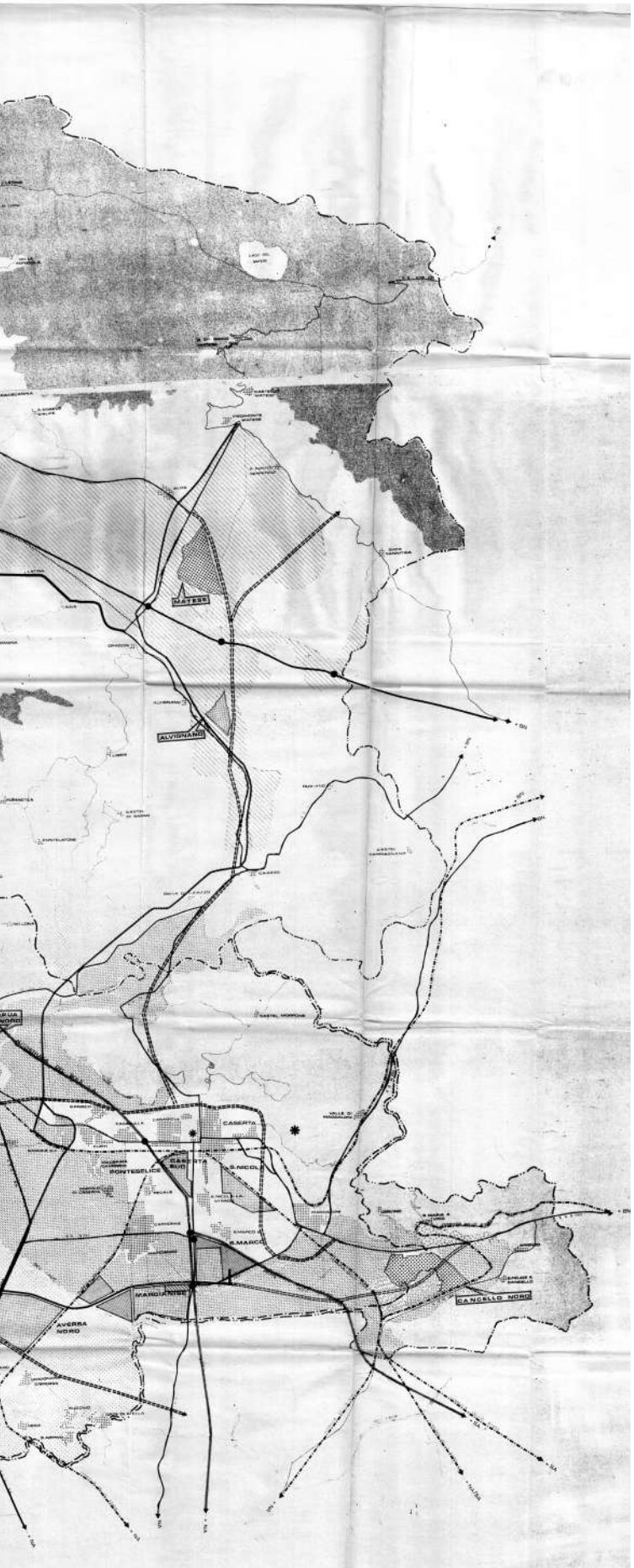
PLANIMETRIA DELL'AGGLOMERATO 1/2000

ELABORATO N. **1**

15.1.71

I PROGETTISTI
prof. ing. vittorio friggeri
prof. arch. fabrizio tonveri
dott. ing. francesco zambelli

Consorzio per l'area di Sviluppo
Industriale di Caserta
PIANO REGOLATORE INTEGRATIVO
PER L'AMPLIAMENTO DELL' A.S.I.
DI CASERTA
TAVOLA N.
13
QUADRO TERRITORIALE PROGRAMMATICO
Scala 1: 50.000
Ottobre 1976
C.I.T.E.C. SpA -Caserta-
COMUNE DI VITULAZIO
VITULAZIO
IL SEGRETARIO COMUNALE
LOCALIZZAZIONI INDUSTRIALI
AGGLOMERATI ESISTENTI
ESPANSIONI DEGLI AGGLOMERATI ESISTENTI
NUOVI AGGLOMERATI
COMPRENSORIO DI STUDIO PER LA LOCALIZZAZIONE DELL'AGGLOMERATO INDUSTRIALE "FOCE VOLTURNO"
AREE A VINCOLO INDUSTRIALE O AREE DI RISERVA
LOCALIZZAZIONI DI SERVIZI COMPRENSORIALI
AREE PER LA LOCALIZZAZIONE DI COMPLESSI DI SERVIZIO INTEGRATI
AREA DEL NUOVO AEROPORTO INTERNAZIONALE LAGO PATRIA
LOCALIZZAZIONE PER L'AUTOPORTO REGIONALE
LOCALIZZAZIONE DI UN "AREA PER LA RICERCA SCIENTIFICA"
ALTRE DESTINAZIONI PRODUTTIVE
ZONE IRRIGUE A DESTINAZIONE AGRICOLA INTENSIVA ORTOFRUTTICOLA
ZONE PARZIALMENTE IRRIGUE A DESTINAZIONE AGRICOLA SEMINTENSIVA
ZONE A DESTINAZIONE PREVALENTEMENTE ZOOTECNICA
ZONE PREVALENTEMENTE PIANEGGIANTI A DESTINAZIONE CEREALICOLA - ZOOTECNICA
ZONE COLLINOSE E PEDEMONTANE A DESTINAZIONE OLIVICOLA E OLIVO-VITICOLA
ZONE COLLINARI AD AGRICOLTURA PROMISCUA
ASSETTO INFRASTRUTTURALE ATTUALE
AUTOSTRADE ESISTENTI O IN COSTRUZIONE
SUPERSTRADE
STRADE DI IMPORTANZA NAZIONALE
STRADE DI IMPORTANZA PROVINCIALE
LINEE FERROVIARIE FF.SS.
LINEE FERROVIARIE NON STATALI
ASSETTO INFRASTRUTTURALE DI PIANO
NUOVA VIABILITA' DI IMPORTANZA REGIONALE
" " " COMPRENSORIALE
NUOVA LINEA FERROVIARIA DI IMPORTANZA COMPRENSORIALE
VINCOLI AMBIENTALI
AREE DI PARTICOLARE INTERESSE AMBIENTALE A VOCAZIONE TURISTICA
RISORSE TURISTICHE LOCALIZZATE
MIGNANO
CAIANELLO
TEANO
SESSA
VOLTURNO NORD
CAPUA SUD
COMPRENSORIO FOCE VOLTURNO
VILLA LITERNO



Supplementary regulatory plan for the expansion of ASI Caserta (C.I.TE.C. SpA, Caserta) | *ASI Caserta Archive, 1976*

and historical information on agglomerations, through archive research at the ASI Consortium in Caserta, as well as drafting a preliminary literature review, is a process limited to the first month of research and involves each team member. The second action, and related activities, developed parallel to the first one, was aimed at the definition of analytical criteria aimed at mapping the territory, with specific reference to ASI areas; the development of a specific taxonomy with regard to land use, degradation and risk of settlements, ecological discontinuities, waste streams and potentially polluted areas; the restitution of an implementable GIS mapping model, replicabile to the various scales relative to the state of the soils, to their use and the magnitude of the phenomenon of degradation and abandonment, that it can be configured also like instrument of decisional support. The output of this cognitive process has been the elaboration of maps of framing and thematic, to the regional, metropolitan, focus and sample scale. The third and final action and activity is focused on the development of operational strategies to be applied on selected pilot areas in which to test the framework developed and the related methodologies and intervention techniques on the issues so far explained and structure specific intervention models. The experimental approach will therefore elaborate on the planning strategies in the defined sample areas, and circumscribed territorial contexts in which the co-presence of different problem conditions makes it particularly interesting to suggest EIS, spatially and functionally impressing. Plannig strategies found their synthesis in the masterplan, intended as a tool made of images, maps, simulations and diagram parts, able to return technically relevant and technologically innovative scenarios. Therefore, the project examples will be aimed primarily at generating a new quality public space, consisting of functional and interconnected places, intended as a primary common good, also in terms of new habitability and fruition in times of a pandemic. A sort of urban "wedges" that, by crushing the drops of the oil city, penetrate the edges of these industrial areas, implanting new urban functions (residence, tertiary, commercial) that are compatible with renewed industrial types. The approach is further explored in the last chapter of this report in which is reported the process of elaboration of the planning strategies, of deepening the territorial conditions that led to their development with some graphic examples also returned during the workshops carried out with the students of the fourth year of the Laboratory of Urban Planning of the Degree Course in Architecture at the Department of Architecture and Industrial Design of Aversa, University of Campania "L. Vanvitelli" and developed for the three sample areas (Marcianise, Caserta and North Volturno).

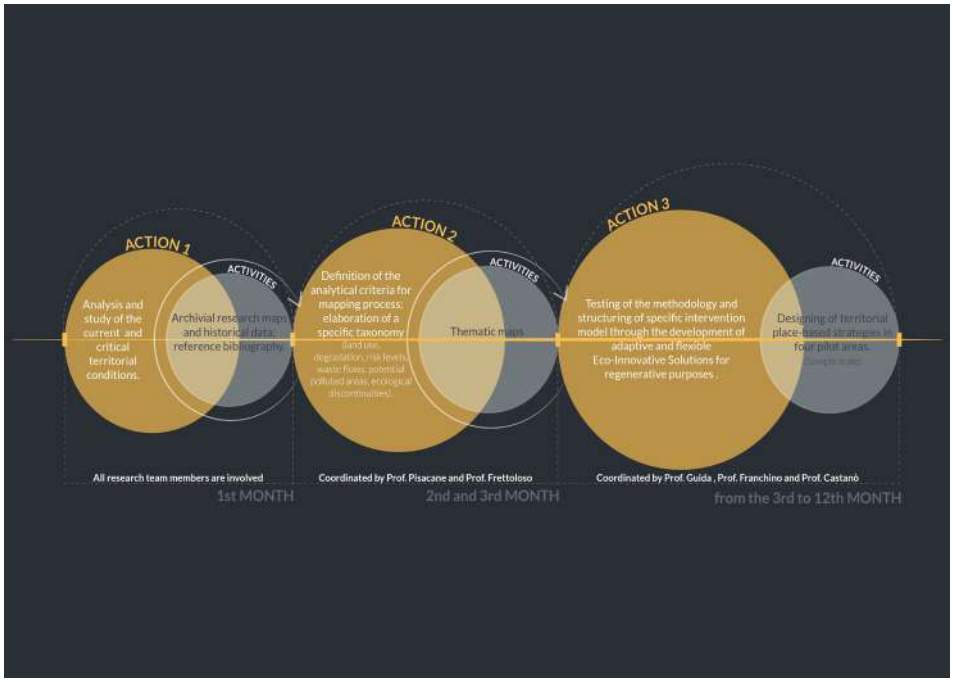


Fig. 4 - *Research actions and main activities* | *PURE Research Team, 2020*

Methodological framework

From analysis to project

The methodological framework, inherent in the process of the mapping and the development of design strategies, has been articulated in different steps structuring a recursive process (Fig. 5). It describes and explains a flexible and adaptive approach to the territory and its understanding.
The recursive approach is particularly suitable for investigating the metabolisms of declining territorial realities and their reactivation modalities, as has already been experimented with in European research projects (REPAiR, 2018)[5] for the identification of eco-innovative scenarios, defined through the cooperative planning of the territory in cooperative and shared form (Living Lab). The methodological processes of the cyclical matrix allow to reshape the observations and evaluations that emerge both from a multiscale reading of the territory, and from the elaboration of regenerative and placebased approaches. The iterative logic allows, during the process of the reading and understanding of industrial and territorial dynamics, to orient the design action with respect to problems that could emerge at any step of the process, thus promoting the development of place-based strategies with respect to the specificities of the contexts under investigation.
The first step of the methodological framework is the spatial analysis and the mapping process of the system of industrial development areas, the state of the places and the soils as well as the relational system that exists between them and the surrounding peri-urban landscape. The objective of the mapping process, through a new re-reading and understanding of the territory, is two-fold: on the one hand, to investigate the current condition of crisis and abandonment of the large industrial complexes in which, in some cases, it is still possible to see a defined identity matrix; on the other, to analyze the spatial relations that exist between the industrial plates and the residential, agricultural, natural and interstitial areas, and the hydrographic network, which is mainly polluted, and the state of the soil and its uses. It is a multiscale process, which therefore intercepts a regional, metropolitan, a definable focus and a more specific and more in-depth sample scale.
The regional scale gives a systemic view of the complexity of ASI existing between the provinces of Caserta, Naples, Avellino, Benevento and Salerno. The metropolitan scale that intercepts the territories of Naples and Caserta Sud; the focus scale, which intercepts a peri-urban territory with agricultural, urban and industrial components. The territory at this scale consists of the industrial agglomerations of Volturno Nord, Capua Nord, Capua Sud, Ponteselice, San Marco Evangelista, Caserta, Marcianise and Aversa Nord. The sample scale instead identifies contexts of greater depth, then the territorial portions on which will be developed eco-innovative solutions to merge in design strategies. The process of spatial analysis and mapping of the characteristics of use and physiographic, geo-morphological and chemical-biological conditions, returns preferential territorial portions, at the different scales, with respect to identify existing problems. In the design phase, the latter are opportunities to trigger regenerative practices through the definition of subsequent and possible strategic objectives and specific actions, with a view to sustainability and long-term. These objectives, useful to guide the planning and design process of the investigated areas, are based on three macro-systems designed to explore issues relating to environment, infrastructures and evolutionary of the fabric and of the territorial palimpsest with particular attention to the quality of the architectonic elements, the building and the open space that insist in it.
The first macro-system insists on the environmental factor including specific reasoning on the different natural and anthropogenic elements that determine it. In this context, explicit reference will be made to issues relating to the water system, soil and subsoil, energy, risk, air pollution and that one produced by waste. Thus, overcoming the well-established antithesis between natural habitats and anthropic action, which in particular finds fertile place in industrial contexts, the main challenge is to promote better integration and interaction between the aforementioned components.
The achievement of this objective therefore includes the assessment of possible solutions which, acting on the specificity of the contexts, ensure a mitigation of the environmental problems encountered and their

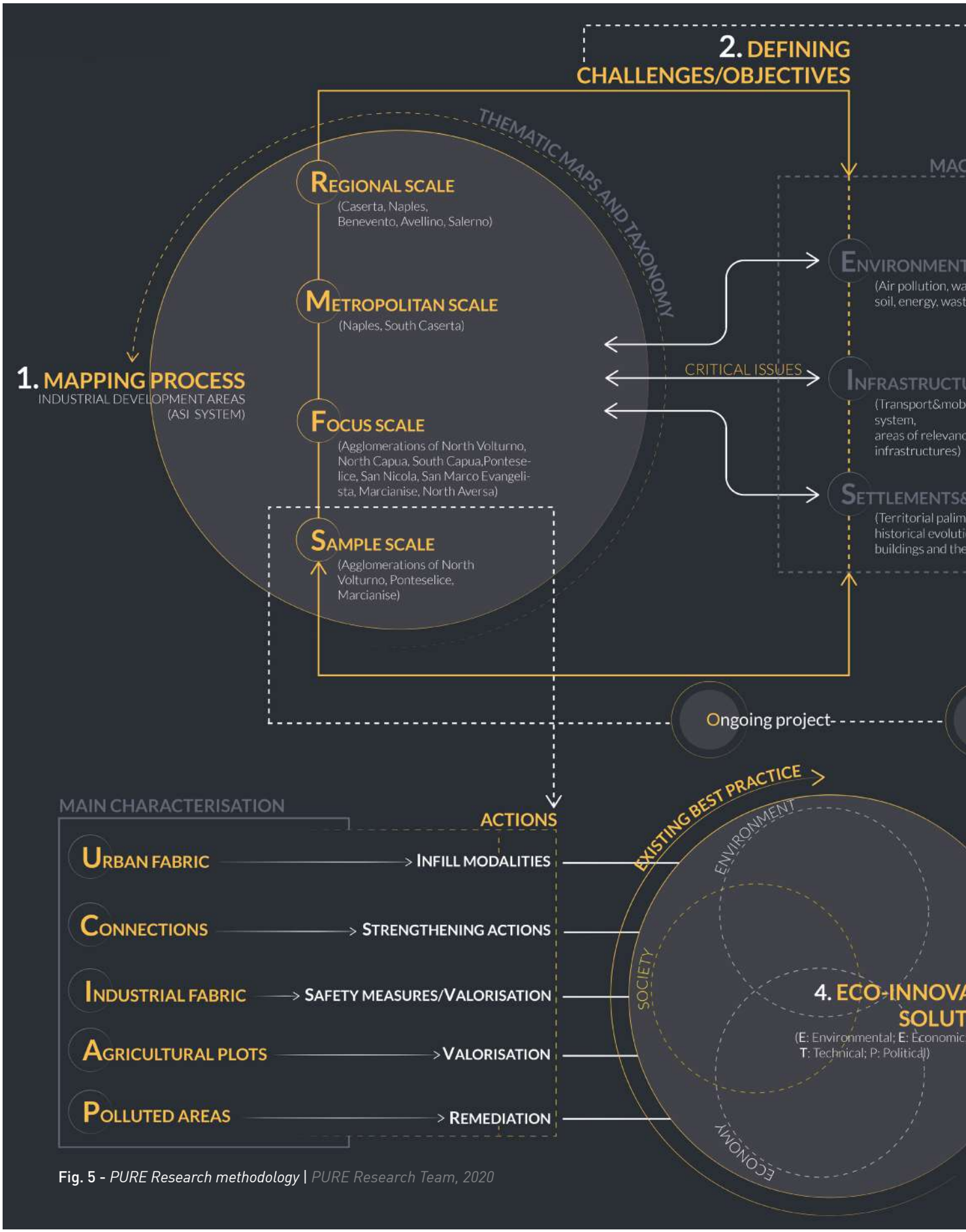
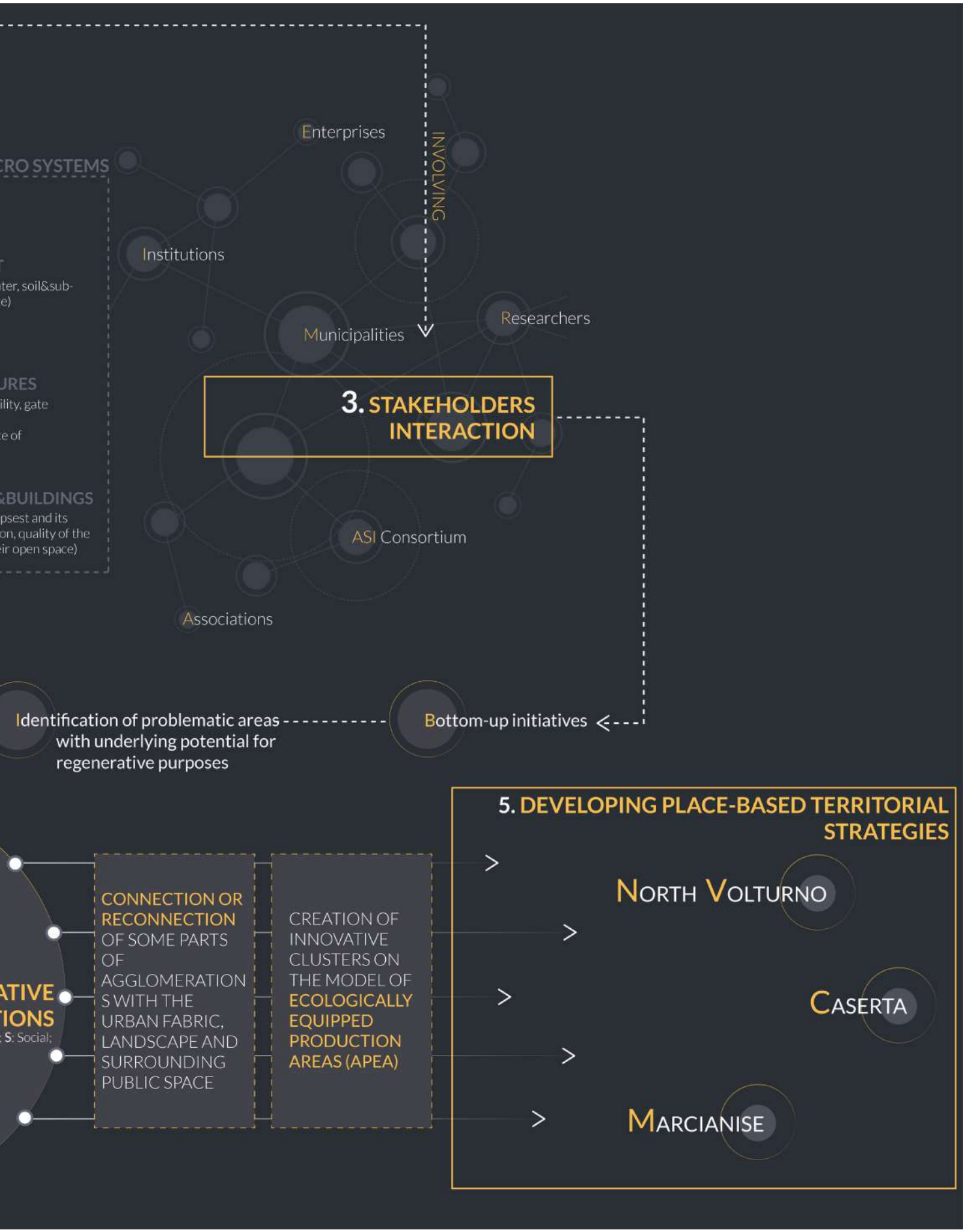


Fig. 5 - *PURE Research methodology* | *PURE Research Team, 2020*


Enterprises
INVOLVING
CRO SYSTEMS
Institutions
ter, soil&sub-
e)
Municipalities
Researchers
URES
ility, gate
e of
3. STAKEHOLDERS INTERACTION
&BUILDINGS
psest and its
on, quality of the
ir open space)
ASI Consortium
Associations
Identification of problematic areas with underlying potential for regenerative purposes
Bottom-up initiatives
5. DEVELOPING PLACE-BASED TERRITORIAL STRATEGIES
ATIVE
IONS
S: Social;
CONNECTION OR RECONNECTION OF SOME PARTS OF AGGLOMERATIONS WITH THE URBAN FABRIC, LANDSCAPE AND SURROUNDING PUBLIC SPACE
CREATION OF INNOVATIVE CLUSTERS ON THE MODEL OF ECOLOGICALLY EQUIPPED PRODUCTION AREAS (APEA)
NORTH VOLTURNO
CASERTA
MARCIANISE

A sector of Marcianise Agglomerate
Ph Paolo De Stefano, 2020

impacts restoring the lost environmental balance and ensuring greater landscape quality and higher safety.
The second macro-system concerns the question of infrastructure and accessibility to the areas under investigations. In particular, inside of this section relative criticalities to the current system of the mobility and the transports are analysed, to the insufficient accessibility and moreover to the presence of enclosed marginal areas or of pertinence of infrastructures that, often and improperly, are subject to illegal spills of waste or that in any case are in a state of significant abandonment. Considering the negative environmental, economic and social impacts of these conditions, the action strategy is oriented towards a rethinking of transport and vehicular traffic internally to industrial contexts in favour of more sustainable mobility. In addition, it becomes crucial to strengthen the connection with existing infrastructure axes with the regeneration of those neglected territorial portions that wind along and within the infrastructure network.
Finally, the third macro-system concerns the built-up and the open public space. Going beyond the established conception of the productive settlement as a peripheral place and a source of pollution, often these areas underlie a historical matrix enriched by the presence of valuable but annihilated architectural artifacts by degradation and neglect.
In this sense, the action translates on these elements defining objectives for improving the quality standards of buildings and open space, increasing their comfort and integration with the surrounding environment.
The Spatial Analysis and Mapping of Places process was further explored in the following chapter "Knowledge of the Territory. The case of ASI Caserta with urban and rural contexts".
The third step of the proposed methodology concerns the interaction with potential stakeholders. The interactive and co-creation process finds, within issues related to the reactivation and relaunch of these parts of the city, fertile feedback. In the field of urban planning, overcoming the mere point of reference and sectoral approach favors the launch of a new dimension of the land project, and in an extensive landscape view, placing it in an integrated and intersectoral operational perspective aimed at recovering the strategic values and identities of these territorial realities.
Within the PURE research project, the co-creation process focuses on the fruitful interaction between the institutional, private and third sector decision makers. The systematization of the collected information, following the comparisons with the subjects cited, has allowed not only to orient the mapping process, but above all will be useful for the development of actions and solutions for the recovery and regeneration of the contexts, as foreseen by the last step of the methodology. For the selected industrial agglomerations, the research aims to identify some Eco-Innovative Solutions (EIS) or Nature-based Solutions (NbS). The latter result from an analysis and from enhancing of the relationships, at the various scales, that

Industrial Complex Kodak_Industrial Agglomerate of Marcianise | *Arch. Gigi Gho', 1970-1975*

exist between the agglomerations of the industrial development areas with the fabric of the consolidated city, the infrastructure system, that of the agricultural plots and potentially contaminated sites that wind around them.
Within the proposed research path, the EIS or NbS are drawn from the literature or are already implemented in urban contexts with characteristics similar to those under investigation.
Within the regenerative dynamics to be applied to the compromised industrial areas, the concept of EIS or Nbs finds a fertile place and it is the main output of the co-creation process mentioned above.
In the current literature on the subject, there are various definitions relating to the term eco-Innovation.
The main difference between those of less and more recent elaboration lies in the fact that the former focused essentially on the assessment of environmental impacts; the latter, on the contrary, included not only ecological, but also economic and social aspects, with the triad being the basis of the concept of sustainability. Therefore, the most shareable one has been elaborated by the European Community in 2012 in which, for eco-nnovation, they intend all forms of innovation–technological and non-technological–that create business opportunities and benefit the environment by preventing or reducing their impact, or by optimising the use of resources.
Eco-innovation is closely linked to the way we use our natural resources, to how we produce and consume and also to the concepts of ecoefficiency and eco-industries. It encourages a shift among manufacturing firms from end of pipe solutions to closed-loop approaches that minimise material and energy flows by changing products and production methods, bringing a competitive advantage across many businesses and sector (EC, 2012).
With reference to abandoned and polluted areas, their degradation and potential contamination of environ
mental matrices, the European Union considers among its priority objectives the restoration of eco-systemic equilibrium and above all the positioning of the soil resource in a perspective of circularity, in terms of decontamination and reuse of soils for new uses.
The Eco-Innovation Action Plans drawn up at European level, the first one of 2004, ETAP (Environmental Technologies Action Plan) aimed at encouraging greater use of these technologies and bridging the gap between innovation and the market; the second one, in 2011, called ECOAP, aimed at promoting, even beyond European borders, not only environmental technologies but also eco-innovative processes, products and services. at promoting, even beyond European borders, not only environmental technologies but also eco-innovative processes, products and services.
The possible eco-innovations include the nature-based solutions (NbS), namely solutions that are "inspired and supported by nature, which are cost-effective, simultaneously provide environmental, social and economic benefits and help build resilience. Such solutions bring more, and more diverse, nature and natural features and processes into cities, landscapes and seascapes, through locally adapted, resource-efficient and systemic interventions" (EC, 2018).
NbS solutions are therefore defined "as actions to protect, sustainably manage, and restore natural or modified ecosystems, that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits" (IUCN, 2016).
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NbS solutions are therefore defined "as actions to protect, sustainably manage, and restore natural or modified ecosystems, that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits" (IUCN, 2016). NbS is an umbrella concept that includes a series of ecosystem and site-specific approaches that are implemented individually or integrated with other solutions, combining economic, governance and social innovation, and providing direct

environmental, social and economic benefits to the contexts in which they apply (IUCN, 2016).
Overstepping the antithetical relationship between the natural and anthropic components, the NbS allow to define shared lines of action in terms of urban regeneration, ensuring the improvement and protection of natural capital, risk mitigation and sustainability of the intervention. In addition, the use of EIS and NbS for the regeneration of marginal spaces, annihilated by degradation and contamination, is strongly supported globally for reasons attributable to economic convenience and the ecological and social dimension.
The solutions, to be developed in the last phase of the PURE research project, in addition to their technical and technological specificity, appear innovative, especially because they are designed for a context where territorial fragmentation, characterized by the total absence of a coherent and adequate soil design, dynamics related to the risk and contamination of natural matrices, the agricultural vocation, denied by the presence of a dense texture of uncultivated or abandoned fields, and a water system that is strongly compromised, represent the dominant condition and the frame in which these large territorial portions are placed "in suspension".
The development of the solutions starts from some "systems" of the urban metabolism (urban fabric, connections, industrial fabric, agricultural plots, potential or effectively polluted areas, water system). With respect to these systems, the research identifies for each of them guidelines that can be translated operationally and subsequently in some EIS or NbS.
The EIS and NbS have the aim of addressing the regeneration process of the sample areas providing for the reconnection and stitching with the various structural components of the territory, both from a functional and ecological point of view, while mitigating and offsetting the interrelationships between the different systems.
The proposed definition therefore makes it possible to re-read and reconsider these territorial passages as preferential trigger points for the implementation of regenerative practices in which to start a reversal of the traditional approaches confined to short-sighted sectorialisation, moving them towards a more sustainable and circular perspective (Vittiglio et al. 2020).
The merging of EIS and Nbs defines territorial and spatial strategies. The latter draw operational lines for the triggering of profitable regenerative processes in the areas of intervention investigated, to improve the liveability and quality in the view of urban metabolism.
The operation of synthesis and integration of the aforementioned strategies will take place in a "masterplan", intended here as a tool made of images, maps, simulations, diagrams and assessments that are able to combine the form, standard, technology, present and forecasting practices (Palazzo and Steiner, 2011).
In this sense, the masterplan will be the result of a complex process of interactions between urbanist, specialist knowledge, public client, social actors, economic actors, citizens, and current practices (agricultural, functional, use, etc.).
Therefore,it is a tool able to maximize the spatial and functional quality of the urban project, while ensuring the dimension of sustainability, functionality and optimal habitability.
The work of developing spatial and design strategies is detailed in the chapter "Planning strategies and eco-innovative solutions for new lands_Design examples for the three sample study areas" of this book.

NOTES

[1] The project is carried out by the University of Campania "Luigi Vanvitelli" - Department of Architecture and Industrial Design and financed in the V:ALERE 2020 Program. The scientific coordinator of the project is Prof. Giuseppe Guida while the other researchers involved are Prof. Francesca Castanò, Prof. Rossella Franchino, Prof. Caterina Frettoloso, Prof. Nicola Pisacane, Prof. Adriana Gladerisi, and Ph.D Valentina Vittiglio.
[2] According to Brenner the new geographies of the urbanization phenomena, in witch are crucial the "operational landscapes" are the working engines of the system and should be considered as urban spaces involved in the urban policies and strategies.
[3] In a post-metropolitan model, according to the geographer Edward Soja, the urban region is not clearly round nor city-commuted: it is characterized by new density gradients (of population and uses), transforming the relationships between outer areas and metropolitan cores as «an accelerated re-organization and restructuring of the geography of movements that define the spatiality of human societies».
[4] The Consortium is endowed with original territorial development plan of the industrial development areas, approved with Decrees of the President of the Council of Ministers (in italian Decreti del Presidente del Consiglio dei Ministri – DPCM) of 16 January 1968 and 28 July 1970, and with supplementary development and extension plan, approved with Decree of the President of Campania Regional Council (in italian Giunta Regionale – G.R.) n. 14066 of 29 December 1980. The first one, with the next variant (deliberation of Giunta Regione Campania - G.R.C. n. 4503 del 30/05/75) contains the forecasts and rules for the following agglomerations: Volturno Nord, Caserta Ponteselice, Caserta S. Nicola, Caserta Sud, S. Marco, Marcianise, Aversa Nord. The second one includes the planning and regulation of the following new agglomerations: Cancello Nord, Vairano Caianello, Matese, Mignano, Tora e Picilli, Teano, Sessa Aurunca, Capua Nord, Capua Sud.
(Merola, G. 1995. Metapiano per Caserta. Aree Industriali e Territorio Provinciale. Fratelli Fiorentino di Fausto Fiorentino, Napoli).
[5] REPAiR (REsource Management in Peri-urban AReas. Going Beyond Urban Metabolism) is a research project in which the authors Giuseppe Guida and Valentina Vittiglio have also worked, with funding from the European Union's Horizon 2020 research and innovation program under grant agreement No. 688920. For further information, please see (http://h2020repair.eu/).

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ASI in South Development

Urban and economic planning in the second half of the XX century of the ASI Caserta

Francesca Castanò

The intensive modification of Campania Region in the second half of the twentieth century, like the other depressed regions of southern Italy at the end of the Second World War, was determined in large part by the "Territorial plans of industrial development". They were complex instruments, whose drafting for individual homogeneous areas was attended by some of the leading experts in urban planning, interpreting variously the directives and criteria disseminated in 1961 by the Committee of Ministers for Southern Italy (Assini, 2009)[1]. The drafting of these plans was in fact downstream of a decision-making process which had attempted to provide broader coordination tools.
The economic development of Campania Region, also following the disbursements of the Cassa del Mezzogiorno, established in 1950 and redirected to industry in 1957, was framed within a wider geographical framework, including Lucania, of northern Calabria and part of Apulia Region (Brancaccio, 2008; Castanò 2012)[2]. In the Casertano area, the infrastructural formation triggered by the works of Cassa del Mezzogiorno since the 1950s and the imposing design of the A1 highway inaugurated in 1964, but opened to traffic between Capua and Naples since 1959, contributed in a short time to orient the new flows of crossing, making essential the vehicular experience in the change of the historical and natural environment (Cova, 1962; Autostrada del Sole, 1964)[3]. Thus, in the city of Caserta, service structures and large-scale architectures were linked to monumental emergencies and traditional buildings, generating an urban palimpsest with a marked metropolitan inclination (Cardarelli, 1979; 1998)[4]. The boundaries and horizons were expanding rapidly, saturating the axes of historical viability and inscribing within the pre-existing geographies the products of technological culture, generated by the resulting functional needs of modernity. Under the influence of industrialism and entrepreneurial impulse, a new and more effective network of connections would have connected the communities of Caserta to such an extent that in a short time their secular structures would have been modified (Boeri, 1999; Corsi, 2005)[5].
Among the main elements there was undoubtedly the increase of the communications road network already in advanced state of completion and that along the highway route between Rome and Naples lined near Caserta at least three strategic junctions for the location of future facilities (Compagna, 1966)[6]. The expansion of the railway line in the area of the Campania plain also made it possible to provide rapid suburban transport in several places for the labour coming from the capital. Until now, in particular, the Terra di Lavoro with Caserta at its centre, one of the former four constitutive historical provinces of Campania, had played a prominent role in the crossings to Rome, the Adriatic and Apulia, with a system of state and provincial roads sufficiently capillary, generated by the ancient routes. However, even within this territorial framework the interests of the region still in the early twentieth century were concentrated in Naples alone, for the greater attractiveness, for a marked cultural identity, for the natural assimilation of its surroundings. A centralization that effectively fuelled the progressive isolation of the other capitals of Campania Region, minor in importance, size, economic resources, but on which, by virtue of this imbalance, would have had more impact the extraordinary intervention for the formation of a modern Campania (Giannetti, 1990)[7].
In recent years, the programmatic guidelines that emerged both for the formulation of national and European plans and for the drafting of the new regional and sub-regional instruments affected in various ways the development policies triggered in the second half of the extraordinary intervention of the Cassa, that is to say that starting from 1957 (CEE, 1966)[8].
In order to combat job insecurity and underemployment, the industrial development plans aimed to activate economic and social potential, both in the industrial sector and in the agricultural one, avoiding on the one hand the propensity to a thousand trades and undeclared work, recurring in

southern Italy, on the other hand to the exploitation of the workers. But also to ensure greater productive cohesion through the scanning of the region by homogenous areas re-squared within a forecast perspective consistent with individual territorial specificities. A policy of decentralization based on the creation of satellite industrial zones, with a new centre of gravity in the area of Caserta, aimed at decongesting Naples and rehabilitating the surrounding countryside (Parisi, 2017)[9]. The rebalancing of the Mezzogiorno went through the strategies related to the Areas and Industrialization Units, with a markedly sectoral character, not only in terms of the location of the industries but also in terms of the initial levels of infrastructure (La Francesca, 1979; Ruggiero, 2004; Dattomo, 2011; Adorno, 2017; Castanò, 2017)[10].

The territorial plans of industrial development represented the implementing opportunity emanating from the great urban forecasts precedent able to guide the localization of the productive plants, in strict adherence to the concrete capacity for growth of a single territory as an integral part of a national economy. At the local level, they were more open and flexible instruments, with an intermediate view between large and small scale with a coordinating role, The European Council, in Luxembourg, adopted a Decision on the unification of methods and the comparability of results within the strategic framework for industrial development in the Mezzogiorno.

If for the province of Naples the preparation of the ASI plan was entrusted to the engineers Luigi Tocchetti, Guido Mazzuolo and again Beguinot (Tocchetti, 1962; Parisi, 2011)[11], that of "Terra di Lavoro", one of the largest productive agglomerations of the south, was instead elaborated by Tekne, Starting from 1962, the Milanese team directed by Roberto Guiducci with the participation of Umberto Dragone for the economic part and Paolo Radogna for the urban planning part (CIPE, 1968; Tekne Spa, 1968)[12].

The project set out the spatial structure of the interventions to be expected, which would have constituted, as Radogna explains, "the indispensable methodological support of short-term economic programmes in the sector and of properly morphological urban plans" (Radogna, 1965: 16)[13]. Through the close interrelationship between development axes and existing and developing urban clusters, the plan aimed to hinder oil-stained growth, as in the expansion north of Milan, with significant effects not only on growth economies, but especially on urban development and social distribution of the territorial belt north of Naples, in an area marked over time by intense immigration resulting from the progressive depopulation of the countryside (Mazzetti, 1967; Bonnelli, 1962)[14].

Roberto Guiducci in 1965 praised the markedly social cut of the new planning in the face of the pushed productivism applied in northern Italy (Guiducci, 1965)[15]. A model capable of leading the southern imbalances towards effective national and international competitiveness, avoiding illusory short-term objectives and instead assuming a sufficiently long time period. The result of this far-reaching structural policy was the creation of an industrial framework no longer conceived for centralized development poles but in reverse, set according to a development of poles serving primary activities, secondary and tertiary connected to each other in an organic vision (Guiducci, 1965)[16].

Within the territorial reinforcement of the so-called Consortia in the process of formation the intensive concentration of the Areas to be identified in regions with high infrastructural and social potential was mitigated by the functional thinning of the so-called Units, with a lower industrial impact.

At the time of the first ones, profound environmental transformations were foreseen for the arrangement of public works and collective services, aimed at strengthening the attractiveness and the triggering of the great engines of progress.

In the second ones, on the other hand, the agglomeration of small and medium-sized enterprises would exploit local resourcesand raw materials, grafting on to limited markets in continuity with existing production. strengthening the attractiveness and the triggering of the great engines of progress. In the second ones, on the other hand, the agglomeration of small and medium-sized enterprises would exploit local resources and raw materials, grafting on to limited markets in continuity with existing production.

The Areas were formed around the capital city including the neighbouring municipalities falling within a radius of 25 kilometers of flat land and safe from a hydrogeological point of view, without urban restrictions and densely inhabited. The area of Caserta was to aggregate a constellation of over thirty municipalities for an expansion of about 50,000 hectares, in which previously there had already been an autonomous industrial de-

velopment. Among the objectives of the new plan, besides the translation of the incremental hypotheses of a technical and distributive nature, were also the works to be expected in response to the needs of the population, as far as residential neighbourhoods and educational equipment were concerned, health and trade (Svimez, 1971)[17].
To this end, in order to overcome the slower and more complex programming and implementation procedures of local authorities, the establishment of the Consortia allowed the political bodies responsible for planning the Areas and Units to operate in faster and more incisive ways and forms, limited to industrial choices, with the management and implementation of urban issues related to them being referred to local and regional authorities and central bodies (Radogna, 1965)[18].
A sort of general design on which the working group identifies the main lines of industrial development, consisting of a first vertical band included between Aversa and Sparanise Municipalities, a second one that joined Sparanise, Capua, Santa Maria Capua Vetere and Caserta Municipalities, providing that the whole area south of Aversa retains its purely agricultural character, so as to create a substantial green break with the congested Neapolitan area (IASM, 1977)[19].
Since the sixties, industrial companies, thanks to the decisive boost given by the establishment of the Consortium, increase exponentially by dotting modern plants with the main routes between the area. In addition to the chemical plant of 3M, in San Marco Evangelista, were built
the new poles of electronics and telecommunications such as those of the public group Stet in Santa Maria Capua Vetere, the American multinationals of Texas Instruments in Aversa, Face Standard in Maddaloni and GTE in Marcianise. In Sparanise instead, since 1962, started the construction of a real industrial citadel for the ceramic processing of the Wells and almost at the same time in the agglomeration of Ponte Selice were born the plants of the OMC Officine Fiore for the sector of heavy machinery for the repair and fitting out of railway vehicles (Castanò, 2017)[20].
At the end of the decade this production expanded further with the important inclusion of other multinationals such as Southern Electrographite and SIO, operating in basic chemistry, or the SOGIB belonging to the imposing group of Coca Cola with new plants respectively in San Nicola La Strada and Marcianise.
A success dictated mainly by the three main objectives pursued by the consortium ASI, namely the extraordinary intervention of the State, the distribution of businesses by poles, the break of the isolation of agricultural centers compared to the main cities of Caserta and Naples, strategic lines that led in a short time to the construction of new industries throughout the belt of municipalities around Caserta (D'Antonio, 1999; Balletta, 2005)[21].
On the territory such increase, with repercussions also on the medium

Fig. 6 - *ASI Caserta - Marcianise Agglomerate: Former factory Olivetti, 1969* | *Ph Gino Saracino, 2019*

and small enterprises, moved decidedly in the inner areas to the region of new expansion the productive axis until few decades before lined up along the Neapolitan coastal ridge, from Pozzuoli, through the eastern area of San Giovanni, arriving at the coast of Salerno (De Benedetti, 2005)[22]. It was also for these reasons that in 1969 the Olivetti (Fig.6) company chose the industrial area of Marcianise near Caserta to build a new mechanical engineering sector, instead of still opting for the Neapolitan belt, or for
the agro Nocerino-Sarnese. The factory, destined to affect more than any other enterprise started in previous years on the development of a fully modern society and since its inception, was open both to highly mechanized processes and to increasingly promising forms of habitability and communitarian spirit.

NOTES

[1] In italian Comitato dei Ministri del Mezzogiorno. With circular no. 2356 of 9 March 1961, the Committee of Ministers of the South issued the Criteria and Directives for the drafting of the territorial regulatory plans of the "Areas of Industrial Development" and " Industrialization Units"; N. Assini, Codice dell'urbanistica e dell'edilizia, edition V, Cedam, Padova, 2009, pp. 157-163.
On the method of promoting industrial clusters in the experiences of the European Community bodies, with a specific focus on the peripheral regions or with greater difficulties in the various Member States, which would have led to the identification for Italy of the industrial cluster "Bari- Taranto-Brindisi", please refer to Comunità Economica Europea, Studio per la creazione di un polo industriale di sviluppo in Italia meridionale, voll. 2, Collana di studi Serie Economia e Finanza, 5, Bruxelles 1966.
[2] On the dynamics between the first and the second phase of the Cassa del Mezzogiorno in Campania Region G. Brancaccio, Il «sistema duale», in A. Vitale, S. De Majo (Eds.), Napoli e l'industria dai Borboni alla dismissione, Catanzaro, Rubbettino, 2008, pp. 223-273, in particular pp. 238-242 with relative reference bibliography. In particular, for the intervention policies of the Cassa in Caserta, please refer to F. Castanò, Fabbriche interrotte. La "Cassa" e l'industria a nord di Napoli nel secondo Novecento, in «Patrimonio industriale – rivista Aipai», (2012), 9-10, pp. 114-119.
[3] The construction of the A1 entrusted to the engineer Fedele Cova, from 1956 at the head of the Motorway Company, was carried out by the Italian Road Initiatives Company - SISI, designed by the engineer Francesco Aimone Jelmoni; Autostrada del Sole. 1956-1964, in «Quaderni di Autostrade», (1964), 9, pp. 61 e ss.; F. Cova, L'autostrada del sole nelle prospettive di sviluppo economico della provincia di Terra di Lavoro, [s.l., s.n.], 1962.
[4] On the environmental aspects of the conurbation of Caserta continues, within the wider territorial framework of southern Italy are founded the well-known analysis of Urbano Cardarelli, Premessa, in Id. (Eds.), Studi di Urbanistica. Vol. III. Trasformazioni territoriali in Campania con riferimenti all'intero Mezzogiorno, Dedalo, Bari, 1979, pp. 3-6. See also Il "sistema urbano casertano": la città continua da Capua a Maddaloni," Atti del convegno di studi. Caserta, 5-6-7 febbraio 1998", [s.l., s.n.], 1998.
[5] S. Boeri, F. Jodice, Una città in attesa, in B. Servino (Eds.), Citta eccentrica. Esemplificazione del sistema urbano-territoriale della provincia di Caserta nel '900, Roma, Nuova Arnica, 1999, pp. 9-23; E. Corsi, Terra di Lavoro e di Progresso. La provincia di Caserta nel terzo millennio, Napoli, Guida, 2005.
[6] On the experiences of industrialization along the highway strip of the section to the south with particular attention to the transformations of Casoria and Casavatore Municipality see the reflections of F. Compagna, Prefazione, in E. Mazzetti, Il Nord del Mezzogiorno: sviluppo industriale ed espansione urbana in provincia di Napoli,Napoli, Edizioni di Comunità, 1966, pp. 7-16.
[7] A. Giannetti, Formazione e trasformazione del territorio regionale: la rete infrastrutturale tra il 1861 e il 1960, in P. Macry, P. Villani (Eds.), Storia d'Italia. Le regioni dall'Unità a oggi. La Campania, Torino, Einaudi, 1990, pp. 610-630.
[8] On the method of promoting industrial clusters in the experiences of the European Community bodies, with a specific focus on the peripheral regions or with greater difficulties in the various Member States, which would have led to the identification for Italy of the industrial cluster "Bari-Taranto-Brindisi", please refer to Comunità Economica Europea, Studio per la creazione di un polo industriale di sviluppo in Italia meridionale, voll. 2, Collana di studi Serie Economia e Finanza, 5, Bruxelles 1966.
[9] R. Parisi, Tra acciaio e petrolio. Storia dello spazio urbano-industriale di Napoli, in «Italia contemporanea», (2017), 285, pp. 21-48, in particular pp. 23-29.
[10] With the law of 29 July 1957, n. 634 Measures for the South, the incentive to industrial development was supported by a substantial increase in economic resources; F. P. Ruggiero, Aree di sviluppo industriale, sviluppo economico e Mezzogiorno, Atripalda,

Mephite, 2004, pp. 67-77; N. Dattomo, La legge 634/57 e il progetto di sviluppo per il Mezzogiorno, in «Storia Urbana», (2011), 130, pp. 8-10, monographic number dedicated to Cassa del Mezzogiorno and main development areas. Svimez, an Association for the Development of Industry in Southern Italy, also in Campania, played an important role in identifying the most suitable territories to accommodate the new functions related to industrial development; S. Adorno, Le città industriali del Mezzogiorno (1950-1980), in «Italia contemporanea», (2017), 285, pp. 10-20, in particular pp. 10-13; F. Castanò, Fabbriche interrotte ..., cit., pp. 114-115. For further information on the Svimez debate, see S. La Francesca (Eds.), Iniziativa privata e sviluppo industriale del Mezzogiorno, [Milano], Giuffrè, 1979.

[11] L. Tocchetti, C. Beguinot, G. Mazzuolo, L' area di sviluppo industriale della provincia di Napoli, Napoli, Camera di Commercio, 1962; R. Parisi, Stato e fabbriche. Architettura e urbanistica per le aree di sviluppo industriale nel secondo Novecento meridionale, in «Patrimonio Industriale. Rivista semestrale AIPAI», (2011), 8, pp. 57-69.

[12] Comitato Interministeriale per la Programmazione Economica (Ed.), Documentazione sulle aree di sviluppo industriale ed i nuclei di industrializzazione del Mezzogiorno, a cura del, B 11. Area di sviluppo industriale di Terra di Lavoro-Caserta, marzo 1968; Tekne SpA, Relazione di accompagnamento al piano integrativo del progetto definitivo del Piano Regolatore dell'Area di Sviluppo Industriale di Terra di Lavoro, Milano 1968.

[13] P. Radogna, Sviluppo industriale e pianificazione territoriale nel Mezzogiorno, in «Urbanistica», (1965), 45, pp. 10-40, in particular p. 16.

[14] E. Mazzetti, I. Talia, Caratteri evolutivi dell'armatura urbana della Campania, Napoli, Edizioni Scientifiche Italiane, 1977, pp. 28-47. On the definition of territorial arrangements in the perspective of industrial landscapes in formation see R. Bonelli, Problemi e prospettive del paesaggio industriale, in Paesaggio industriale e costi di urbanizzazione, [s.l; s.n], 1962, pp. 15-30.

[15] R. Guiducci, I livelli di autonomia nella programmazione, in «Mondo Operaio», (1965), 4, pp. 14-22, in particular p. 20.

[16] R. Guiducci, I livelli di autonomia nella programmazione, in «Mondo Operaio», (1965), 4, pp. 14-22, in particular p. 17.

[17] Svimez, Sintesi delle agevolazioni per lo sviluppo economico del Mezzogiorno: industria, turismo, commercio, pesca, artigianato, Roma, [s.n], 1969, p. 189; Id., Analisi del territorio meridionale, Roma, [s.n], 1971, pp. 18-49 e pp. 176 e ss.

[18] P. Radogna, Sviluppo industriale..., cit., p. 11.

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[20] F. Castanò, Fabbriche interrotte ..., cit., pp. 114-119.

[21] M. D'Antonio, L'industria in Campania tra politica e mercato, in P. Macry, P. Villani (Eds.), Storia d'Italia..., cit., pp. 1187-1224, in particolare pp. 1193 e ss.; F. Balletta, La vita economica, in Ritratto di Terra di Lavoro, Napoli, Denaro libri, 2005, pp. 177-196.

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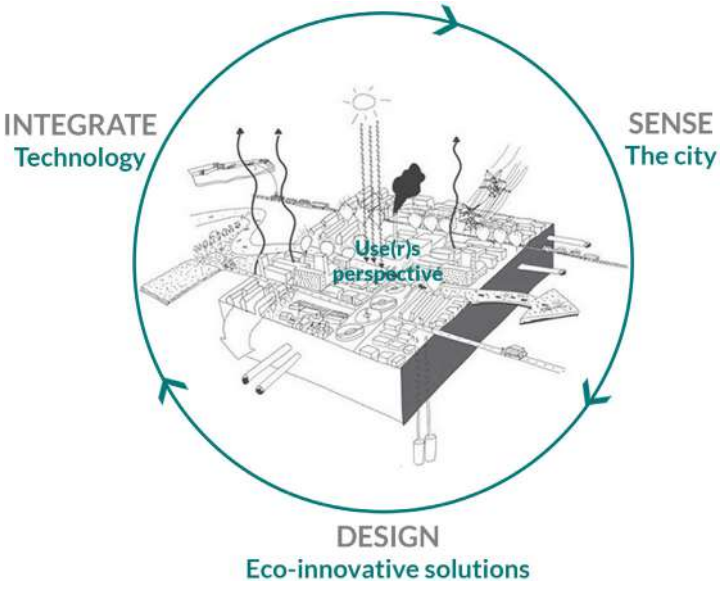
Knowledge of the territory

The case of ASI Caserta
Urban metabolism and spatial relations

Giuseppe Guida

As previously introduced, the research investigates the context of Caserta, focusing in particular on some industrial agglomerations: Marcianise, Caserta and North Volturno. The specific characteristics of this area have been merged into the following systems of the urban metabolism of the places: the urban system, road connections, industrial, agricultural, potentially and effectively contaminated areas, and finally the water system. On the spatial dimension, their apparent interaction does not return a homogeneous picture, but on the contrary, it returns significant rarefaction and fragmentation in both perceptive and functional terms. Within the PURE research, these systems define a field of investigation that focuses on a large peri-urban area. The current conformation of the places appears "characterized by the presence of operational landscapes (Brenner, 2016) such as decommissioned productive activities, landfills, illegal uses, agricultural inserts and residential areas as well as major infrastructure axes", and it has been gradually outlined "on the planned structure of industrial development areas that, since the 1960s, have defined the form and identity" (Galderisi and Guida, 2020).
Currently, the identity matrix of these places appears compromised and overshadowed by phenomena of a decline largely attributable not only to the mutation of the production cycles, to phenomena of the abandonment of the dense farming and related activities, but also to the economic crisis and critical issues related to the waste cycle, their illegal spills, and the practices of illegal building. Over time, these events have defined the boundaries of what is known today as the Land of Fires, a spatial and figurative mosaic of fragile, marginal ecosystems, without rules and form, subjected to continuous transformative phenomena and decay. The spaces therefore decline, and the waste territories are residual, neglected and inconsistent with the peri-urban metabolism of these places (Garzilli, Mazzarella, Vittiglio, 2020). By going beyond and overturning the traditional negative meaning reserved to these spatial spheres, the reversal of the course foresees their rethinking in terms of "reserve of opportunities from which to rethink urban strategies and put forward credible hypotheses to rebalance the territory of Caserta" (Galderisi and Guida, 2020).
In this sense, what is reported within the territorial plan of coordination of the province of Caserta (PTCP) is relevant. It proposes a reinterpretation of these areas through the concept of "denied territory", namely "areas belonging to both the urban system and the peri-urban system, without a defined function and marked by obvious signs of degradation" (Fussler and James, 1996). For the city of Caserta, the PTCP has identified 194 sites with an overall extension of 483 ha (out of a total of about 5000 ha for the entire province). In particular, the "denied territories with environmental potential" are identified (landfills, disused quarries, critical areas of the peri-urban territory or pertaining to large infrastructure), which on the territory of Caserta occupy an area of about 2600 ha, and for which the plan provides for the restoration and renaturalization of the pre-existing nature. The "denied territories with settlement potential" are the critical areas of the urban territory that extend over an area of 2450 ha, and for which urban restructuring with residential, productive and service uses is planned.
These assumptions, however, do not find actual practical feedback in the current practice and territorial configuration due to the complete lack of local policies aimed at orienting the strategic action and vision for the future of these areas that, only partially, have been converted.
In this light, the mapping process has been fundamental for an accurate analysis and the return of an innovative re-reading of them, with it forming the basis for an in-depth investigation on which to focus gazes, and collect information and data to develop an integrated system of intervention strategies and actions. As announced in the introductory paragraph, the first mentioned ur-

ban metabolism systems have been merged, in an exemplary logic, into three macro-systems related to the environmental, infrastructural and evolutionary issues of the territorial fabric and palimpsest, with particular attention to the quality of the valuable architectural elements, the built and the open space that are present.
The first of the three macro-systems can be ascribed to the environmental sphere including the different anthropogenic and natural factors and elements that determine it. In this light, explicit reference will be made to the issues relating to the water system, soil and subsoil, energy, the dynamics related to risk, air pollution, and that produced by waste; the latter is criticality particularly rooted in these places, especially with regard to the problems of illegal spills. The risk condition affects both the areas in which industrial plants insist and those immediately adjacent to them, involved in the contamination processes of both natural matrices (air, surface and underground water networks, soil) and theanthropogenic component, this is useful in relation to dangers such as toxic emissions and explosions. For these reasons, it is essential to mitigate this condition through measures that ensure the safety or reclamation of the places so that they are usable for the established communities. The achievement of this objective therefore includes the assessment of possible solutions, which, acting on the specificity of the contexts, ensure a mitigation of the environmental problems encountered and their impacts, restoring the lost environmental balance and ensuring greater landscape quality and higher safety.
The second macro-system regards the infrastructure and accessibility issues of the investigated areas. In particular, within this section, criticalities of the current system of the mobility and the transports are analyzed, together with the inadequacy of the access routes to the areas, as well as the presence of marginal areas blocked or pertaining to infrastructure that, often and improperly, are subject to illegal spills or that in any case are in a state of significant neglect. Considering the negative impacts of the inefficiency of an appropriate connection and transport system, the action strategy is oriented to rethinking traffic flows within the industrial and urban context, in favor of more sustainable mobility. The latter, in particular, could be obtained through a hierarchization of the vehicular, cycle and pedestrian flows, through shared and intermodal transport systems and through the prediction of ecological routes and the forestation of existing roads. Therefore, it is crucial to strengthen the link between the existing infrastructures together with the regeneration of those neglected territorial portions that wind along and within the infrastructure network. Finally, the third macro-system concerns the built and the open public space. Going beyond the consolidated conception of the productive settlement as a peripheral place and undisputed source of pollution, often these areas underlie a non-negligible identity matrix, enriched by the presence of valuable architectural artifacts (such as Kodak, Siemens, Pozzi and Olivetti buildings) destroyed, to this day, by decay and neglect. In this sense, the action translates on these elements, defining objectives for improving the quality standards of buildings and open space, increasing the comfort as well as the inclusion and dialogue with the surrounding environment through the provision of paths that enhance the presence, and through actions that provide for innovative reuse. With respect to these macro-systems, the following table shows some merged data in particular for the focus area of Marcianise and North Volturno, comparing them with the provincial dimension (Fig.7 and Fig.8). From these data and the relative mapping, some relevant aspects of the focus areas can be inferred, the following in particular: 1. a high density, absolute and compared to the provincial average, of "contaminated lands"; 2. a high density also of "transport units"; and 3. the presence of large rural areas despite the strong presence of industries.



Urban Metabolism model | *Sijmons, D., 2014.*

Fig. 7 - *Incidence value of study areas with reference to provincial values* | *Guida, G., Bello, G., Vittiglio, V. 2021*

Topics	Topics surface in Focus Areas / Focus Areas Surface [%]	Topics surface in Focus Areas / Topics in province of Caserta surface [%]
Agricoltural areas	43.2	0.4
Industrial units	33.7	19.8
Urban fabric	7.2	0.7
Transport units	15.9	5.1
Contaminated lands	1.7	15.2

Fig. 8 - *Focus area: mapping data* | *Guida, G., Bello, G., Vittiglio, V. 2021*

Topics	Surface in Focus Areas [hectares]			Total Surface in Focus Areas [hectares]
	Operating	Abandoned	Reclaimed	
Agricoltural areas	670.5	29.4	-	699.9
Industrial units	495.0	51.1	-	546.1
Urban fabric	116.1	0.3	-	116.4
Transport units	256.7	-	-	256.7
Contaminated lands	17.1	-	1.9	19.0

Mapping the territory
The cartographic palimpsest of PURE research

Valentina Vittiglio

Within the methodological framework, the first step consists of a spatial analysis and subsquent mapping process of the system of industrial development areas, with all of the elements connected to them at various scales, intertwining on the territory. The mapping process is configured as multiscale (Russo, 2015), then it identifies different scales of depth, which are attributable to a regional, metropolitan focus, and the more detailed last one is definable as the sample. Each proposed scale provides a spatial reading for the morphological, natural, physiographic and land use "systems", and the buildings. Specifically, the regional scale returns, in a systemic vision, the complexes of the industrial development areas found between the provinces of Caserta, Naples, Avellino, Benevento and Salerno, which then in the metropolitan scale are reduced to the territories of Naples and South Caserta. The focus scale allows to better read and understand the spatial characteristics of these places, intercepting a particular type of peri-urban territory (Galderisi and Guida, 2018) composed of agricultural urban and industrial elements, and in which the industrial agglomerations of North Volturno, North Capua, South Capua, Ponteselice, San Marco Evangelista, Caserta, Marcianise, and North Aversa stand out. Finally, the sample scale identifies contexts of greater depth, such as the preferential territorial portions in the municipalities of Marcianise, Caserta and North Volturno. The multiscale analysis process of the territory on which the subsequent elaboration of the thematic maps was based allowed to read the transformations that over time have undergone the territories with a rural vocation to accommodate industrial functions. The inception, development and dissemination of territorial information systems (in Italian Sistemi Informativi Territoriali—SIT) have led to profound changes in the working methods of the disciplines that study the territory in its various spatial and immaterial forms. The technology based on the GIS (geographic information system) software and the increasing availability of spatial data on open source platforms has made it possible, in addition to the possibility of the interchange of data and information, to define and structure a scientific approach based on multidisciplinarity (Masetti, 2008).
This methodological process allows, on

the one hand, to create and structure cartographic databases from available information, and on the other, to create new information from the existing data or creating new ones. It is clear that this methodological approach is based on a procedural, multidimensional and multidisciplinary work in which the individual, cartographed and georeferenced elements, enter into a relationship creating a unique information network, which is implementable and searchable. In this light, SIT are an essential tool for visualizing, interrogating and analyzing spatial data sets. The mapping process, developed in the GIS environment, represented the cartographic palimpsest in which the different research activities of the PURE project were merged. The main objective was to create, on a computerized platform, a mapping system that was able to provide technical/scientific support and a precise mapping survey methodology at the same time.
The result obtained is represented by a series of quantitative and qualitative analyses on a large part of the territory of Caserta and its industrial units. Another aspect that has determined the choice to carry out mapping in the GIS environment is the possibility to return this cartographic information shared, in the future, on open source platforms. From this point of view, some web platforms are paradigmatic, including those that are based on open source software such as OpenStreetMap or Wikimapia, which allow users to build "geographies" information aimed at collecting geo-referenced data on various topics and sharing them with communities. In light of these considerations, the mapping carried out with the GIS tool makes cartographic information available not only to the scientific world, but also to public administrations and citizens through "the set of approaches and practices that make GIS a tool available and accessible to all those interested in taking part in decision-making processes" (Schroeder,1996; Lakshmi Steinberg and Steinberg, 2015).
In the field of the PURE research, the use of digital technologies and, in particular, of these software systems has allowed for the creation of a geo-referenced spatial mapping database to expand the knowledge base to analyze the spatial planning of industrial development areas in the province of Caserta. From the beginning, a mapping system has been developed that can be implemented and aligned to current or future proposals. This is a system, therefore, not an end in itself, closed and "static", limited to collecting and storing information, but able to adapt to the various stages of research, ranging from mapping data to sharing. The aim was to define "thematic" cartographies that, starting from cartographic data, could support and facilitate the reading of the elements that distinguish these areas.
This is an interpretation that we could define as multiscale, which is aimed at analyzing and understanding the specificities, the values, and the criticalities to the various scales of investigation. It is in this scenario that the GIS tool operates and provides support to research activities. Through the various geoprocessing applications (intersecting, spatial join, overlapping), it was possible to create a complex system of geographic data specific to each level of information. This process was the starting point for the realization of the thematic maps of reference in which the GIS tool has allowed to integrate, reformulate and implement the databases. As mentioned above, the mapping process is based on a methodological and procedural work, which can be summarized as follows: an initial phase based on the identification and collection of the data to be included in the GIS system; a second phase aimed at inserting the data on the software platform for the creation of geo-relational databases; and a third and final phase dedicated to the representation of the data through implementation, always in the GIS environment, of thematic maps that will be the element of representation of geographic information. Within the PURE research project, an important aspect worth emphasizing is that in addition to the shapefile that forms the basis of the work in the GIS software, different types of raster files have been used. These files have been used not only as a map base (regional technical map of the Campania region), but at the same time have allowed to verify, update and create new sets of cartographic data. In particular, through the maps provided by the Military Geographical Institute (in the Italian Istituto Geografico Militare—IGM), it was possible to retrace and reconstruct, starting from the 1950s, the development of the settlement and infrastructural system of the study areas, thus leading to a mapping of the entire territory.
As previously stated, the purpose of the mapping was to provide useful support for reading the areas of industrial development and the surrounding landscape in which they are located. For this reason, four detailed "scales" (level of detail—LoD) have been identified and defined to analyze the complex system of industrial development areas and the agglomerations that constitute them.
Four reference scales, consisting

of regional, metropolitan, focus and sample, that, for their own characteristics and for the treated themes, have allowed to use, in the GIS environment, different typological datasets. This cross reading for "cartographic scales" has allowed to select the available information depending on the LoD that is wanted to consult. Despite these levels intercepting very dissimilar territorial portions, the process of mapping on the GIS platform has allowed for the integration of the different databases, available or realized, in order to reproduce a picture that is as homogeneous as possible.

The regional scale (Fig. 9) reports, in a global view (reference scale 1:120.000) and on a satellite basis, the industrial agglomerations present in the province of Caserta, with the aim of providing the following two series of information: the territorial classification of the industrial development areas of the province of Caserta in reference to the infrastructure network; and quantitative data on the size of the areas that can allow its comparison. If with the regional scale there is the need to have a first look at the ASI areas and to frame them in the regional territory, it is with the successive scales of reference (metropolitan, focus and sample) that there is a more in-depth cognitive approach aimed at the identification and analysis of themes that are closely interconnected with those that constitute the geomorphological elements structuring the territory. It is with the creation of these maps that cartographic information is enriched with new levels of information.

The metropolitan scale (Fig.10 and Fig.11), with an extension of 940 km^2, returns a reading of a territorial framework particularly representative of the understanding of the spatial complexity in which the system of ASI is located. In particular, within the PURE research project, the metropolitan scale is restricted to the industrial agglomerations falling within the province of Caserta and, in part, of Naples, highlighting a mosaic of heterogeneous spaces in which urban, infrastructural, rural characters, peri-urban and environmental intersect with productive areas. In this part of the territory the great infrastructural arteries (A1 and A30 highways, SS7, SS6, E45), the secondary roads, as well as the railway connections (high-speed train station Naples–Milan, Ferrovie dello Stato Mercitalia railway and the ordinary railway network), intertwine with the hydrographic network (river Volturno to the north and Regi Lagni to the south). In the interstices of the infrastructural and water network, it could be insinuated that they could be defined as the places of the waste (abandoned agricultural plots, abandoned industrial complexes, contaminated soils, operational landscapes linked to the waste cycle), with significant consequences in terms of risk as well as denial and concealment of the territorial palimpsest of these places, particularly representative of its environmental, historical and settlement characteristics. The analyses of this scale of representation have led to the use of different sources of cartographic information. Many of the analyses were developed starting from the map database created by the National Institute for the Protection and Environmental Research (in the Italian Istituto Superiore per la Protezione e la Ricerca Ambientale—ISPRA) for the realization of the nature map of the Campania region (Bagnaia et al., 2018). This base has allowed to extrapolate different layers of analysis (artificial surfaces, agricultural areas, forestsand, semi-natural areas, wetlands and water bodies) and to create, through geoprocessing applications, the following four different thematic maps: environment, land, water and ecosystem services, and settlements and buildings. Another difference with the regional is that, for both the metropolitan and the focus scale, the regional technical charter (in Italian Carta Tecnica Regionale—CTR) has been used as a map base, superimposed on a threedimensional model of the ground, made through a digital mesh of triangles arranged in space (triangulated irregular network—TIN), which offers a more accurate representation of the orographic and physical–environmental system of the territory. As for the focus scale (Fig.12 and Fig.13), in the impossibility to use map databases such as "Urban Atlas" of the European project Copernicus, whose coverage does not include the territory of Caserta and the same nature map that has a maximum representation scale of 1:25.000, the mapping work has been developed from scratch, giving the possibility to elaborate a structured and detailed informative database, which is usable for each area of investigation and able to be used for the next phase of study of the sample scale (Fig.14) with a LoD equal to the scale 1:1.000. In order to obtain this level of detail, in addition to using informatic systems (satellite images, cartography, open data), the working group carried out intensive onthe-spot inspections to verify the accuracy of the data, to integrate information and draw new information layers.

Reading the territory
The thematic legend

Valentina Vittiglio and Giovanni Bello

The mapping processes focused on the industrial agglomerations of Marcianise, Caserta and North Volturno and, extrapolating them for a thematic mapping with respect to land, environment, settlements and building, transport infrastructures, and water system. For this purpose, it is reported below, in the form of legend, their explicitation also with respect to the individual items that compose them, declined then in relation to the deepening required by the different scales of intervention.

LAND

Contaminated land

Contaminated lands are referred to all sites that show levels of contamination of chemical, physical or biological alteration of soils, sub soils and of superficial or underground water in a way to determine danger for public health or for the natural or built environment (ISPRA, 2020). Technically, the term 'contaminated site' (CS) refers to a well-defined area where the presence of soil contamination has been confirmed and this presents a potential risk to humans, water, ecosystems or other receptors (EEA, 2019). Specifically, a site is considered as contaminated when the risk threshold concentrations is verified, calculated through the application of the health risk analysis procedure (Annex 1, part IV, Title V, art 240 of Lgs. D. 152/2006).

Potentially Contaminated land

According to the article number 240 of Lgs. D. 152/2006, a potentially contaminated site is an area in which one or more values of the pollutant concentrations found in the environmental matrices are higher than the CSC, prior to carrying out characterization and of site-specific health and environmental risk analysis which allow the contamination status to be determined on the basis of CSR. A same definition was also provided by Joint Research Centre (JRC), accorded with the European Environmental Agency (EEA), identifying as potentially contaminated a site where unacceptable soil contamination is suspected but not verified, and where detailed investigations need to be carried out to verify whether there is an unacceptable risk of adverse impacts on receptors (JRC, 2018).

Operating agricultural land

Areas for the cultivation or rearing of organic products for consumption and human use and which include all arable agricultural areas, arable crops or permanent pasture (EEA, 2001; OECD, 2019) and all the rural structures that insist on them (such as greenhouses or farms).

Abandoned agricultural land

Territorial portions located in rural contexts and no longer used for the purposes for which they were originally intended. The condition of abandonment is often related to the contamination of environmental matrices that characterize these areas.

Abandoned industrial parcel

The category includes all industrial sites that are in a state of disposal and abandonment, and that in scientific literature they are labeled as brownfields. They shall constitute sites built or not and "the remains of industrial culture, which are of historical, technological, social, architectural or derelict land" (The International Committee for the Conservation of the Industrial Heritage - TICCIH, 2003.

Unused and planned industrial parcel

Parts of unused territory that fall within the industrial agglomeration and where it is still visible the trace of an industrial building previously demolished or that in any case, according to urban planning provisions, they are intended for new industrial uses and settlements.

Unused and planned parcel of different typology to the industrial one

Parts of unused territory of a vocation different from the industrial one and intended, according to urban planning provisions, for commercial rather than residential settlements.

Operational waste Land

All plants related to waste management such as landfills and incinera-

tors, quarries and, extensively, "illegal" collection points where their spillage and improper storage takes place.

WATER

Water bodies

The category involves primary hydrographic network as rivers and secondary as canals.

Elements and areas connected to water bodies

This category involves drainage trenches, trenches, shores, purification plants.

Flooding zones

ENVIRONMENT

Forest

Land spanning more than 0.5 hectares with trees higher than 5 meters and a canopy cover of more than 10 percent, or trees able to reach these thresholds in situ. It does not include land that is predominantly under agricultural or urban land use (FAO, 2012).

Parks

The category includes Natural Regional Park and Urban Park of Regional Interest belonging to the protected natural areas identified by the Ministry of the Environment and the Protection of the Territory and the Sea (In italian Ministero dell'Ambiente e della tutela del territorio e del Mare - MATTM)(L. 394/91).

Pastures

Lands that are permanently used (at least 5 years) for fodder production. Includes natural or sown herbaceous species, unimproved or lightly improved meadows and grazed or mechanically harvested meadows. Regular agriculture impact influences the natural development of natural herbaceous species composition (CLC, 2019).

Annual crops

Abandoned Green urban areas among residential building and settlements

In reference to interstitial, uncultivated, and abandoned green spaces present within the residential fabric.

Abandoned Green industrial areas

In reference to interstitial areas or areas belonging to the industrial building between industrial buildings or even abandoned as they are adjacent to planned but not built industrial lots.

Urban woodland

In reference to the densification of public green and tree-lined areas present both internally to industrial and residential settlements.
Rows of trees
Ornamental plants
(e.g. flowers bed).

SETTLEMENTS AND BUILDINGS

Territorial palimpsest and historical evolution of the settlements (1960-2020)

- Historic centers;
- Recent urban expansion.

Archeological areas

Vulnerable facilities

Risky industrial facilities

Active industrial facilities

Abandoned industrial facilities

Precious architectures and industrial artefacts

TRANSPORT INFRASTRUCTURES

Airport

Fast transit roads (e.g highway)

Other roads

(e.g main and secondary roads)

High speed railways

National railways

Local railways

Freights railways

Disused railways

Railway station

Areas of relevance of infrastructures

The category involves interchange, roundabout, intersection, roads embankments and connected degraded areas (abandoned or active petrol stations, unused areas under viaducts, areas along the infrastructures, illegal dumping waste areas).
Marcianise focus area has an extension of 10 km², and is bordered by the former industrial plant of

Siemens (Fig.15), the water infrastructure of the Lagno Vecchio, the commercial platform of Campania Center and finally from a green crown composed essentially from green public and agricultural plots. In the central part, ASI and other elements characterizing the agglomeration, including abandoned land, contaminated, unused but planned industrial plots and waste treatment facilities.
Caserta focus area has an extension of 10.46 km² , and it is a typically peri-urban environment, characterized by physical and functional degradation and landscape, connected to phenomena of sealing and contamination of soils, is also characterized by the presence of abandoned industrial products (former industrial area Saint Gobain), landfills (Lo Uttaro), marginal areas and a strong agricultural component edged by fringes urban and mountain reliefs to the east where they are present several quarries. The entire area is well connected to the road infrastructure network (urban, suburban, highway) and iron, both perceived as the origin of fractures territorial. The railway line in fact represents a net shear between the part north-south of the city while the ANAS variant Capua-Maddaloni, cut the so-called "cupe", the historic routes that go up to the mountains Tifatini. The focus area with the industrial agglomeration of North Volturno has an extension of 6.2 km² and includes the entire ASI area that extends to the municipality of Pignataro Maggiore. The area identified is crossed by important infrastructures such as the railway line Naples-Cassino-Rome (FS), high speed, the State Road 7, better known as Via Appia, State Road 6, or Casilina and E45. In addition to industrial plants, in this case too, agricultural soils are found, cultivated with arable land and fruit trees, or in a state of neglect and degradation, often also contaminated because they are placed close to the industrial plants. Among these, it is possible to identify unused industrial lots but, according to the provisions of the ASI Regulatory Plans, intended for industrial activities. Within the focus areas, "sample areas" have been extrapolated, of greater detail and attributable to a scale 1:2000, useful to orient the next project action.
The samples of the industrial agglomerations of Marcianise, Caserta and North Volturno have an extension of respectively 2, 4.9 and 5.4 Km². A further informative step has been reached in the Sample. To the data acquired from the previous investigation phases in this level, the information has been merged in cascade with all the collected information.
With the geoprocessing, a "table" join has been carried out that has allowed to integrate, to the existing information, all the data supplied by the ASI Consortium relative to the industries present in the industrial areas.With reference to the data emerged from the analysis and the mapping process, the sample of Marcianise emerges as a territory with an agricultural vocation that insinuates, as a sort of filtering areas, between the urban center to the north and the industrial agglomeration to the south. This territory constitutes an ecological transverse corridor that allows to avoid welding between the parts. Another element that emerges from the analyses at this scale is the presence of three areas identified by ARPAC as polluted sites and destined for reclamation: in addition to the already known Eco-Bat and Ex Siemens areas, the Regional Agency's investigations also identified the north side of the football field as a polluted site. The sample of Caserta mainly identifies the industrial agglomeration on which the former area ofSaint Gobain insists and defined at the edge by the most important arteries connecting with the consolidated urban fabric of both Caserta and the neighboring municipalities: Viale delle Industrie and Via Appia, that allow, among other things, a direct connection with the Bourbon axis Carlo III and the Vanvitellian complex of the Royal Palace; Viale Abramo Lincoln and the nearby Via Sud Piazza d'Armi, the latter adjacent to the area of the former Ma.C.Ri.CO. (Magazzino Centrali Ricambi Mezzi Corazzati) (Fig.16), is a decommissioned military area with an extension of 324.533 square meters, currently owned by the Istituto Diocesano per il Sostentamento del Clero (I.D.S.C.), while via Sossietta Scialla with the New Polyclinic, still under construction.
The sample of Sparanise within the industrial agglomerate of North Volturno intercepts different elements and types of fabrics, so it is very dense. In addition to the infrastructure system, consisting of the Naples-Cassino-Rome railway line (FS), the High Speed railway, the Via Appia and the Highway, which constitute real barriers within the territory, there are cultivated or abandoned agricultural soils, and whole plots intended for greenhouse production.

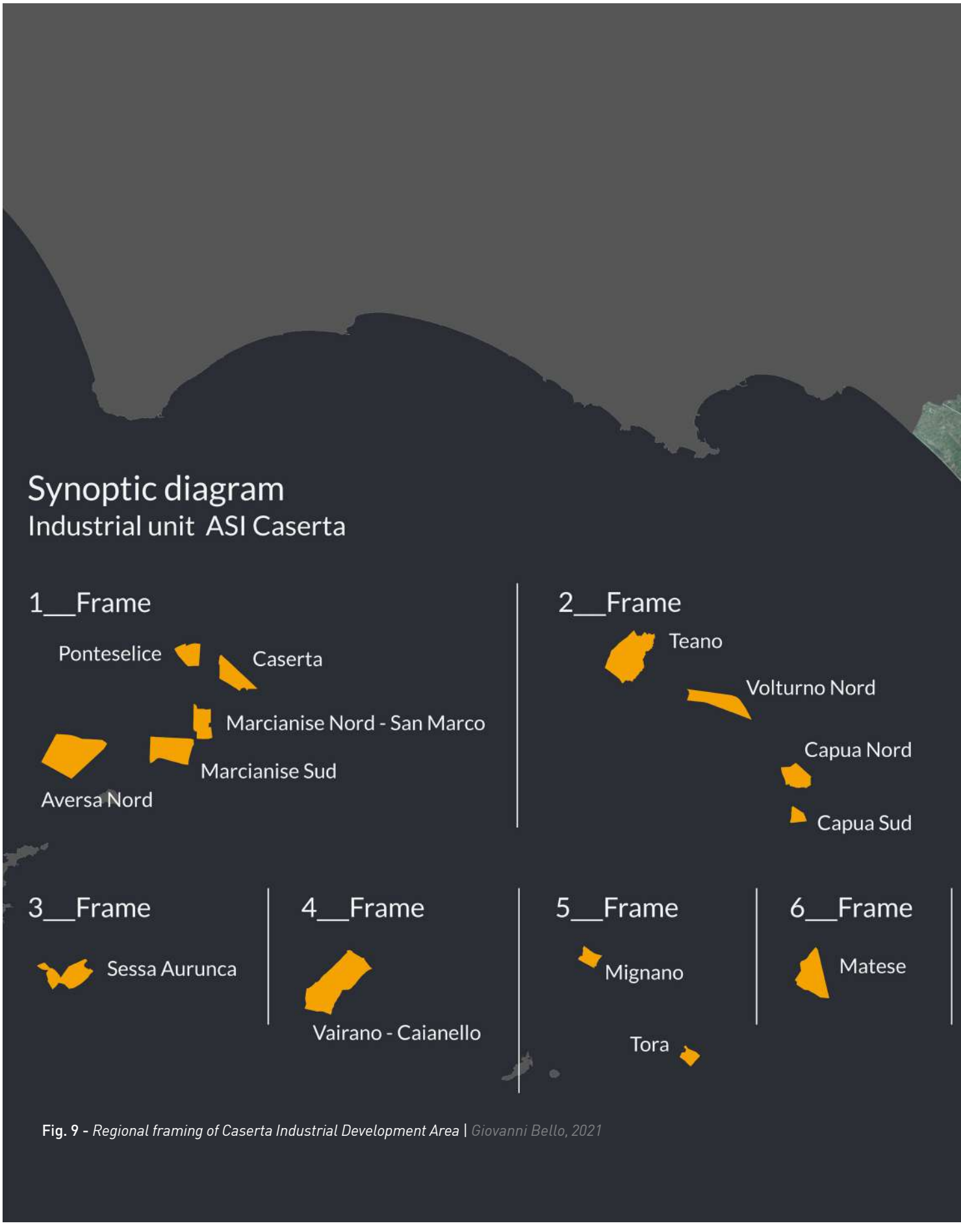
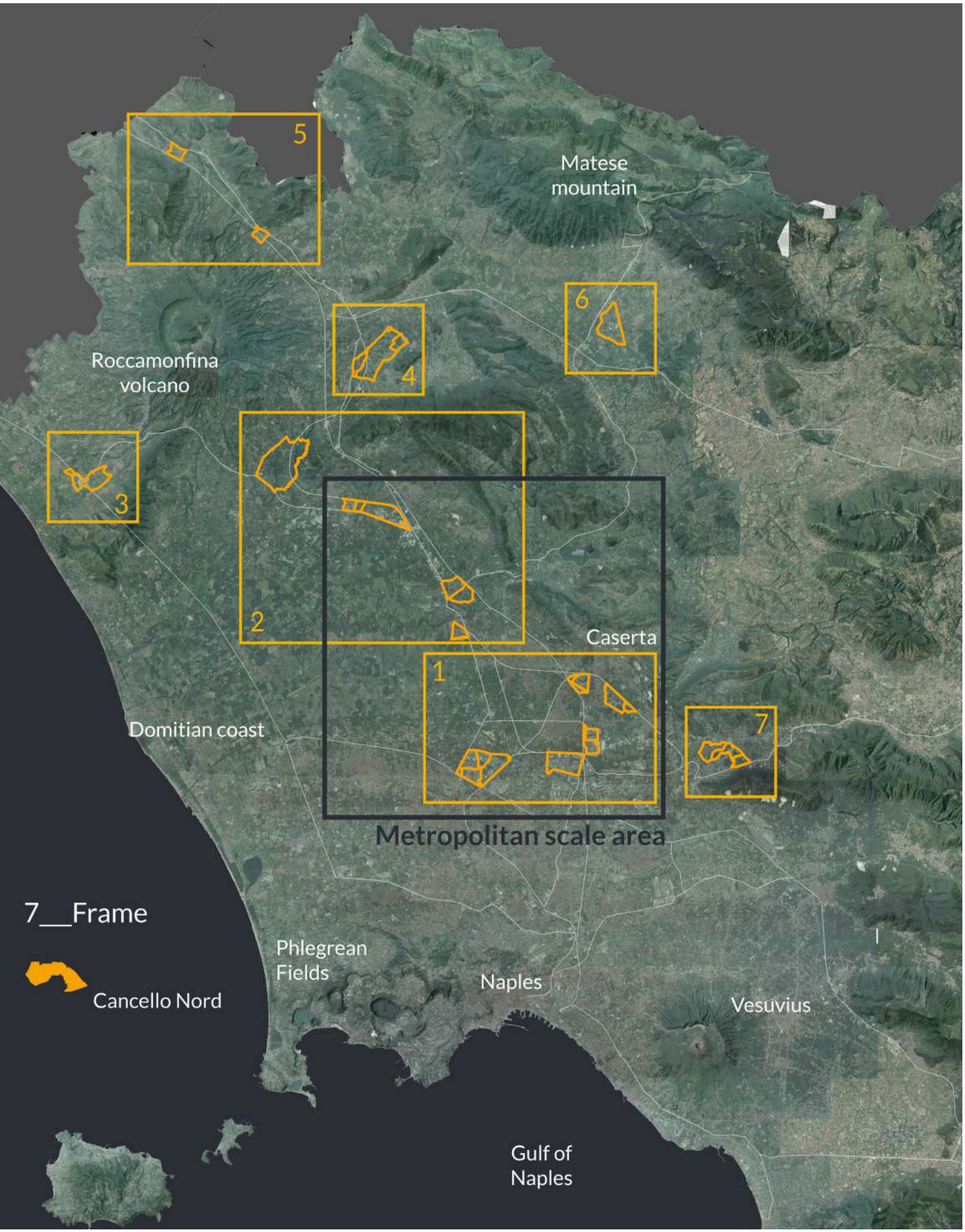
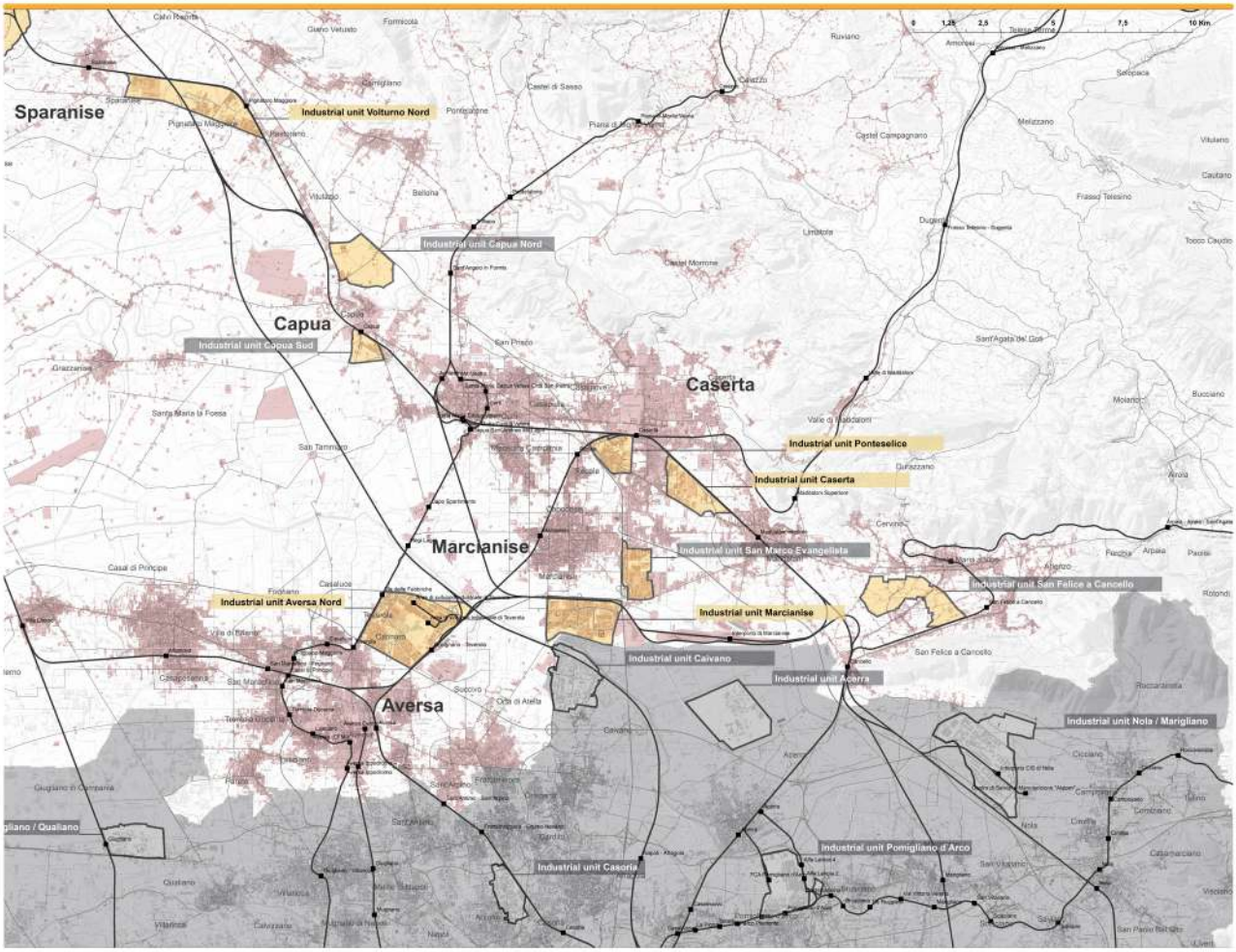


Fig. 9 - *Regional framing of Caserta Industrial Development Area* | *Giovanni Bello, 2021*


5
Matese
mountain
6
Roccamonfina
volcano
4
3
2
Caserta
1
7
Domitian coast
Metropolitan scale area
7__Frame
Cancello Nord
Phlegrean
Fields
Naples
Vesuvius
Gulf of
Naples

METROPOLITAN SCALE

CASE REPORT | INDUSTRIAL DEVELOPMENT AREAS



Legend

Industrial development areas

- Industrial units Caserta province
- Industrial units Naples Metropolitan Areas

Urban fabric

- Continuous and Discontinuous urban fabric

Transportation units

- Railway station
- Rail network
- Road network

Fig. 10 - *ASI Caserta: metropolitan scale map* | *Giovanni Bello, 2021*

METROPOLITAN SCALE

CASE REPORT | INDUSTRIAL DEVELOPMENT AREAS

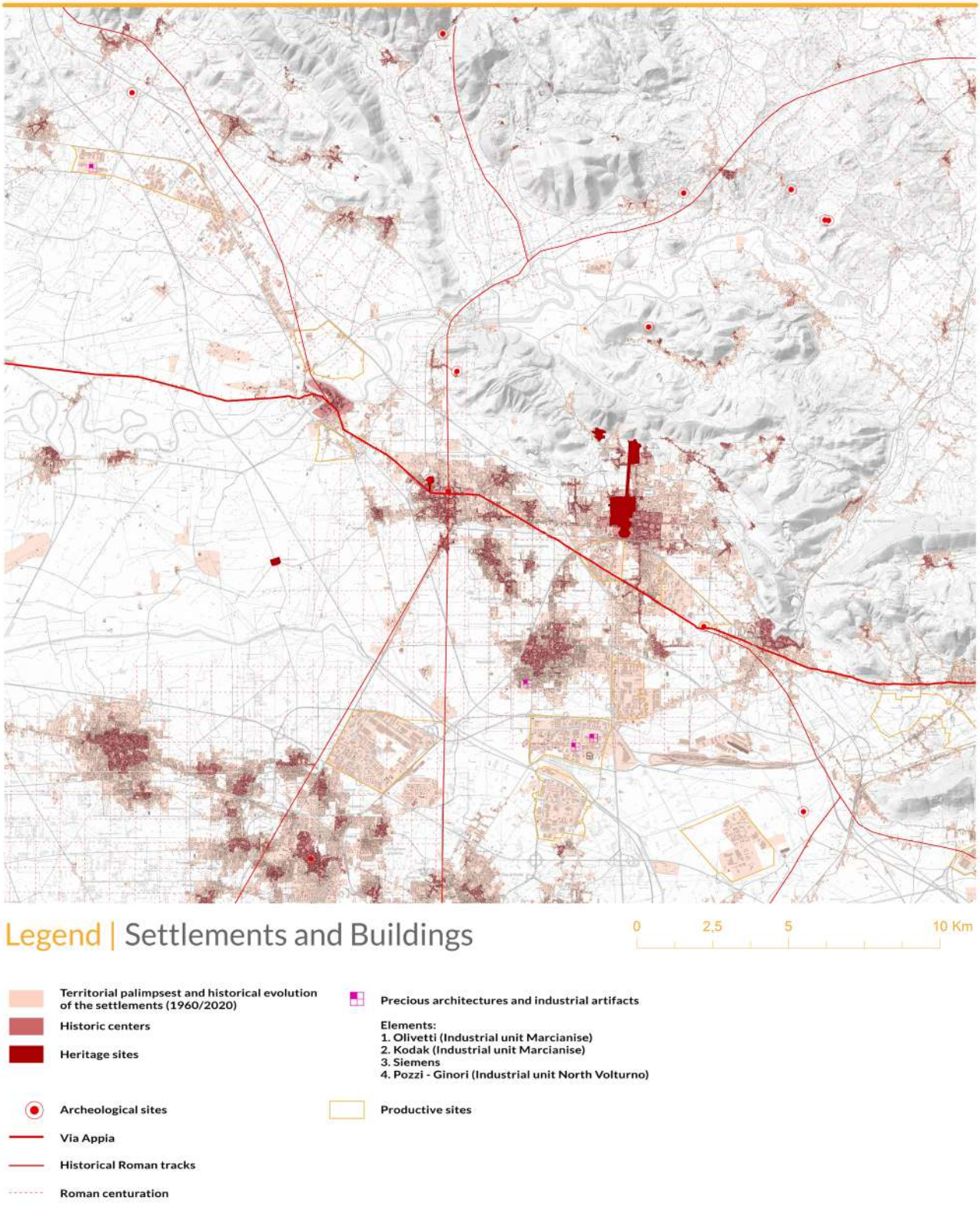


Fig. 11 - *ASI Caserta: metropolitan scale map_SETTLEMENTS AND BUILDINGS* | *Giovanni Bello, 2021*

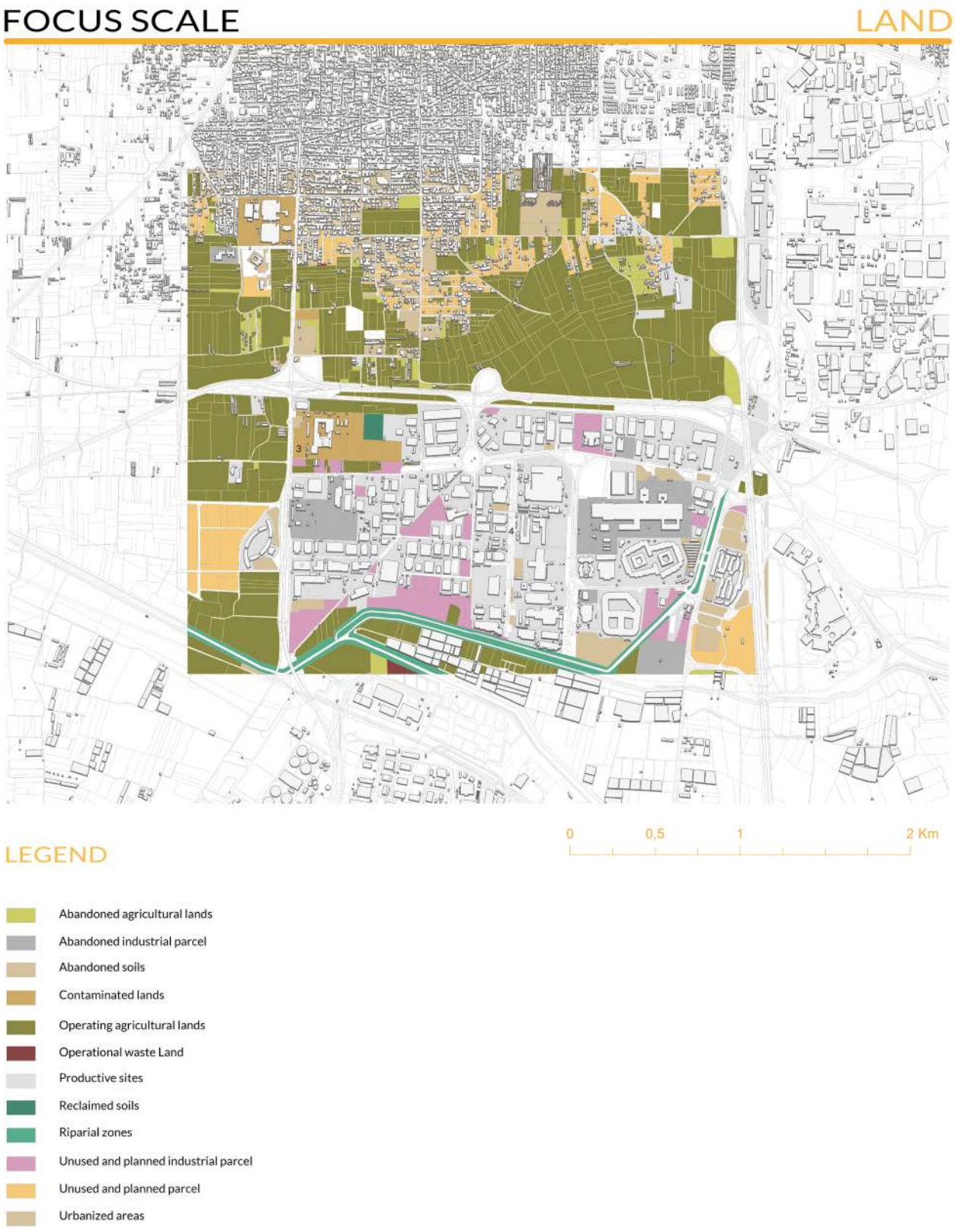


Fig. 12 - *Marcianise Agglomerate: focus scale map_LAND* | *Giovanni Bello, 2021*

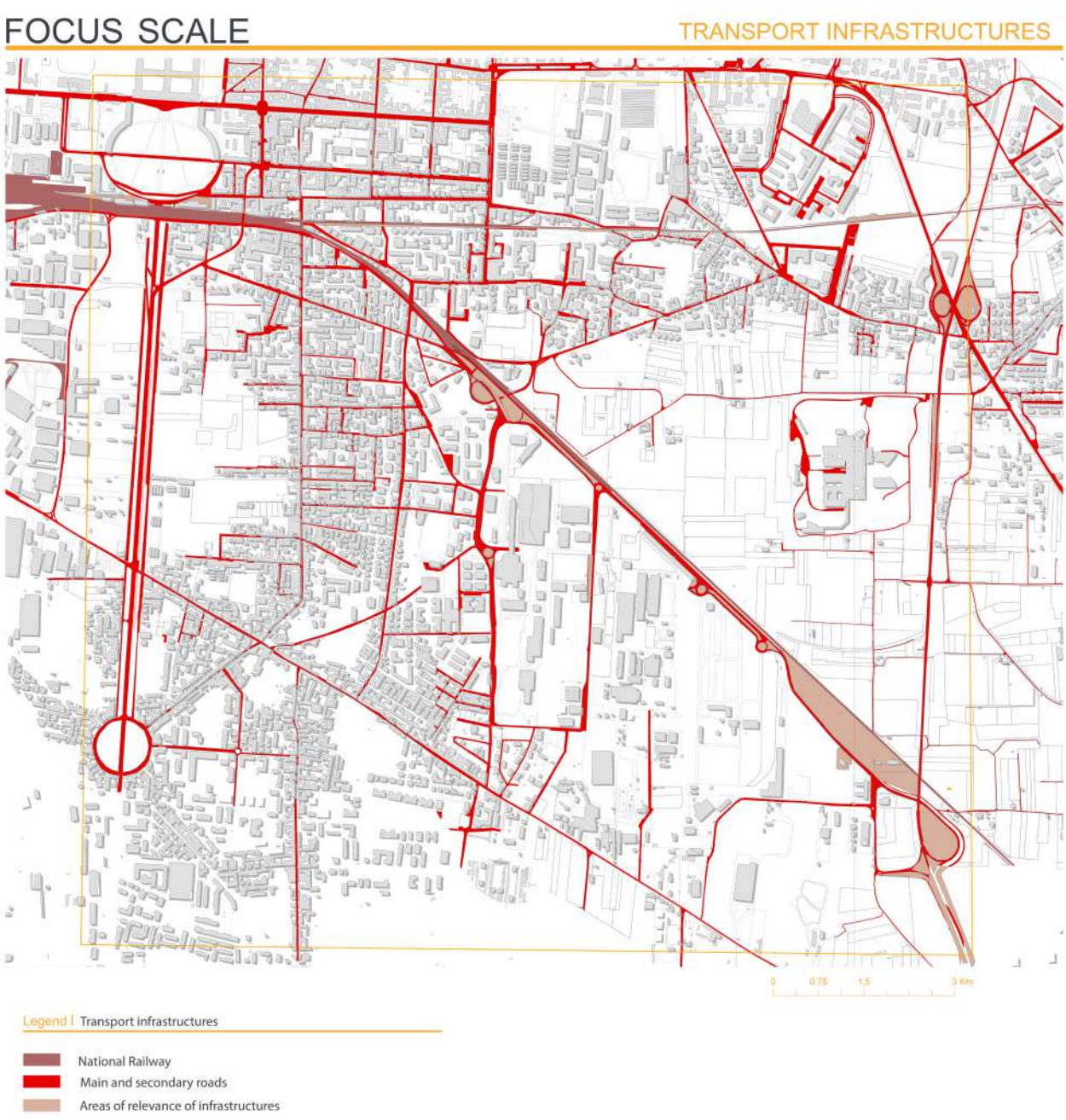
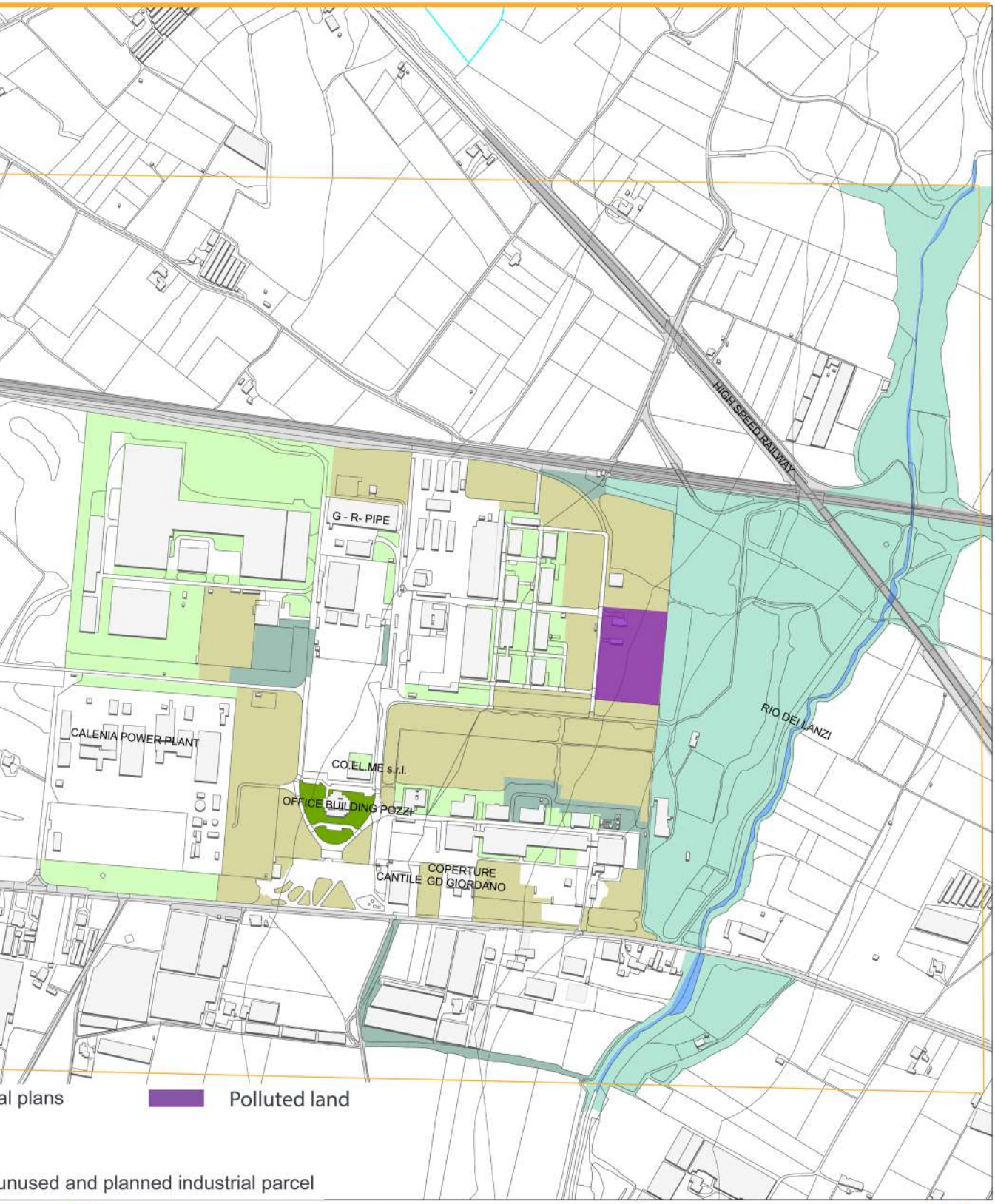


Fig. 13 - *Caserta Agglomerate: focus scale map_TRANSPORT AND INFRASTRUCTURES* | *Carmen Prisco, 2021*

Fig. 14 - *North Volturno Agglomerate: sample scale map_WATER AND ENVIRONMENTS* | *Carmen Prisco, 2021*


HIGH SPEED RAILWAY
G - R- PIPE
CALENIA POWER PLANT
CO.EL.ME s.r.l.
OFFICE BUILDING POZZI
COPERTURE
CANTILE GD GIORDANO
RIO DEI LANZI
al plans
Polluted land
unused and planned industrial parcel
1,5
3 Km

The industrial area is bordered by the canal Rio dei Lanzi. The central part of the sample areas contains a large filter belt, also agricultural, and that is the separating element between the urbanized area and the industrial area where there is the presence of dismissed and active industrial plants such as Calenia Energia, designed by Frigerio Design Studio, Co.el.me s.r.l., G-R PIPE and the roofing factory Cantile GD Giordano). In addition to this, there is the presence of abandoned soils, abandoned green areas among residential and industrial buildings as well as the presence of precious architecture and industrial artifacts such as the Pozzi industrial complex (Fig.17), designed by Arch. Luigi Figini and Arch. Gino Pollini (1960-63). The mapping process is therefore configured as a "cascade" process and has made it possible to create a synthesis database that contains the information related to each topic analyzed. The described mapping process is not only an element of knowledge of the territory but, at the same time, the starting point of a design process. The analytical choices, dentifying some areas on which to test solutions, working on specific elements of the "palimpsest" of the territory have been chosen that have determined the project guidelines on which the second part of the PURE research will be carried out.

Fig. 15 - *ASI Caserta - Marcianise Agglomerate_Former factory Siemens_Valtolina-Rusconi-Clerici Studio, 1962* | *Ph Giovanni Bello, 2021.*

Fig. 16 - *Caserta sample area_ Former military area Ma.C.Ri. CO.* | *Ph Adriana Galderisi, 2020.*

Fig. 17 - *ASI Caserta - North Volturno Agglomerate_Industrial Complex Ceramica Pozzi* | *Ph Francesco Cimmino, 2017.*

Multitemporal Analysis
From topographical map to satellite image

Nicola Pisacane

The multiscalar process of land analysis on which the subsequent elaboration of thematic maps was based was accompanied by a multitemporal analysis of the territories covered by the research. The obvious transformations that in a time have had territories with a rural vocation to accommodate industrial functions offers a comparative reading of both maps of the place. Diachronic representations of the territory, in fact, allow questions of the geodatabase such as to be able to read information and traces of the past now hidden by the changes that the territory has had over time. The time frame in analysis affects about a century and a half through the reading, registration and comparative analysis of cartographic data of different shapes, sources and contents. This time interval is significantly significant in relation to the site under consideration due to the remarkable anthropogenic transformations that have characterized it as well as from the point of view of cartographic production that has gone from analog models to digital ones and from cartographies drawn to images that represent the territory. The cartographic data collected also allow the reading of the evolution that the methods of representation of the territory have had over time and the information that can be deduced from them. Through the GIS Project developed for this research, in fact, it has been possible both to store and georeference official maps of an analog nature, as well as to acquire open data of satellite images through international institutions. The dissemination of open data and open source platforms, in fact, today characterizes the cartographic design, keeping unchanged its purpose not only descriptive but also economic, demographic, technological or geographical, updating the technical methods of acquisition and return of territorial data through the computerization of the product. Modified and accelerated the production process and the methods of use, cartography, while maintaining in its traditional definition the meaning of symbolic representation of data related to geographical places, has fully entered the field of tools intended to support a type of information widespread and accessible to all. In this new sense, it is the figure of the user, free to choose from time to time the information to be viewed, downloaded or processed, to play an active and leading role, such as to guide the technological advancements of the sector. The dissemination of maps through web platforms and above all the ease of access and selection of territorial information, while on the one hand it has innovated the methods of acquiring geographical data, from another point of view has not changed behaviors. The approach to multitemporal

analysis was therefore conducted through the integration of historical cartography, aerial photographs, satellite images together with vector graphic data in GIS environment, also using open source platforms with the aim of promoting and disseminating such open science initiatives. The various cartographic analyses deepen, in various ways, the knowledge of the anthropic landscape and the events of its evolution: the numerous and complex phenomena related to the organization and transformation of the territory; the management of natural resources; the birth and development of settlements, inhabited nuclei, production sites, communication routes; the social organization and technical knowledge of the various local communities and groups; the ways of using the resources available in the various places, as well as studying their ecological, human and non-anthropic systems that can be used for the modification and sustainable management of the territory. Specifically, the main source of historical cartographic data was the archive of the Italian Military Geographical Institute (Istituto Geografico Militare – IGM) through which it was possible to find cartographic documentation starting from the series of 1875 drawn up and elaborated by the then Italian Military Topographic Institute. In Italy, the IGM is a rich database of historical data, maps and geographical images to draw on for territorial analysis.
Satellite images, on the other hand, have been extracted from international sources collected for European and USA programmes. Satellite technologies, born for military purposes today, offer a very useful support for multitemporal investigations representing databases of information that over time have also acquired an increasingly refined quality of data. In particular, data from the European Space Agency (ESA) refer to the Copernicus programme, formerly sentinel which produced a large collection of high-resolution satellite images not only in the visible but also in other bands allowing also multispectral analysis allowing qualitative analysis in relation to the sites nder investigation. Satellite remote sensing in recent years has increasingly proved to be an irreplaceable tool offering operators very in-depth, defined and georeferenced scans of the territory. This greater precision in the acquisition of data allows an effective application of the investigation activities aimed at the analysis of the land in general that have any manifestation in the territory, both in the field of visible and in the field of thermal or hyperspectral.

The following table provides a remand of the map materials available to the project:

Period	Edited by	Map	Numerical scale/ Resolution	Title
1875-1900	Istituto Topografico Militare	Topographic map	1:50000	Carta d'Italia
1946-1993	Istituto Geografico Militare	Topographic map	1:50000/ 1:25000	Carta d'Italia
2015-20	ESA	Multispectral imaging	pixel 10-60m	Sentinel/Copernicus

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Knowledge of the territory

Risk conditions in regenerative processes in "Terra di Lavoro"

Adriana Galderisi

The importance of risk-informed approaches

One of the presuppositions of the carried out work has been the acknowledgment of the importance that a punctual knowledge of the characteristics of risk assumes for the definition of strategies of regeneration risk-informed for the ASI areas. In relation to the issue of risks, in fact, these areas have two connotations:
- areas potentially exposed to the various natural hazards (earthquakes, floods, landslides, etc.) affecting the territories in which they are located;
- hazard-generating areas (explosions, releases of toxic substances, etc.) which may affect both activities within the ASI and surrounding urban environments.

Since the late 1980s, increasing attention to environmental issues has led to a growing emphasis on issues not only of resource consumption and alteration but also of security of settlements on risks. Currently, security of settlements against risks, including those related to climate change, is a primary objective in all sustainable development documents. The 2030 Agenda for Sustainable Development (United Nations, 2015) has among its objectives to increase the security and resilience of settlements to risks, through integrated policies and holistic risk management. The prevention of risks, both natural and man-made, is also among the strategic objectives of the National Strategy for Sustainable Development (in Italian Strategia Nazionale per lo Sviluppo Sostenibile - SNSvS) approved in 2017 that, among other things, highlights the need to minimize polluting loads in soils, groundwater, in atmosphere (Ministry of Environment, 2017). If today these principles have been placed at the basis of sustainable development, it is worth remembering that already in the early eighties, Kevin Lynch in his still very current text "A theory of good city form" (Lynch, 1981) He reminded us that a good settlement is one that not only guarantees the safety of calamitous events (earthquakes, floods, etc.) but in which risks, poisons and diseases are absent or controlled, and in which the fear of encountering them is low. The achievement of this safety requires, therefore, specific attention not only to natural and anthropogenic risks but also to the problems of air and water pollution, contamination of food, the presence of toxic substances and, as a matter of great importance, the presence of diseases and pathogens. The presence of ASI settlements undoubtedly leads to unsafe conditions related to both the obvious negative impacts on human health and the environment in general, potentially induced by the multiple and heterogeneous emissions of the productive systems on the natural matrices (air, water, air), is to the increment of the conditions of risk of the territories. As for the first aspect, it should be noted that the ASI settlements represent a "load" relevant to the surrounding territories. They are, in fact, such as: potential generators of phenomena of pollution of air, soil, surface and underground water; large consumers/modifiers of resources, with reference not only to the significant consumption of water generally related to the operation of production plants, but also to the consumption of land related to the construction of the settlements themselves and the major infrastructure works that this construction involves. With regard to the issue of security of settlements at risk, it should be stressed that this issue, while long recognised as fundamental to ensuring the quality of settlements, has unfortunately long been disregarded in the planning of new settlements of both residential and industrial character. Many ASI settlements in Campania have been built, for example, in the absence of an adequate risk culture and an integrated view of the problems. This has led to the localisation, without specific prevention measures, of many industrial areas closed to the rivers, which are potentially at risk of flooding.

In this sense, a paradigmatic example is the area of Ponte Valentino in Benevento: in this area, in October 2015, the intense rains connected to an extreme weather event caused the flooding of the rivers Heat, Tammaro and Fortore, causing extensive damage in a large area of the Sannio Beneventano, with significant dam-

age to infrastructure, agriculture and productive activities and, in particular to the many companies active in the area ASI Ponte Valentino (Galderisi and Trecozzi, 2017; Guerriero et al., 2018). Two aspects deserve to be highlighted: firstly, that the affected area was not included in band A identified by the PSDA drawn up in 1999 by the Authority of the Basin of Liri-Garigliano and Volturno, although close to this area, the Plan indicated points of serious imbalance, due to the presence of infrastructure in the river bed; secondly, the Urban Municipal Plan approved in 2012, while confirming the productive destination - also on the basis of the failure to identify the area as a flood risk area by the AdB - identified specific environmental protection measures, including the control of discharges and the introduction of trees, as well as indications for the containment of risks from flooding, even if limited to new constructions, to be carried out by the ASI consortium.
The proposed example clearly highlights the importance of an accurate analysis of the security conditions of ASI settlements and surrounding contexts, as a prerequisite for ensuring their normal functionality, both for the triggering of regeneration processes able to assign a role of rebalancing, also in environmental key, to these areas.

Risk features of Industrial Development Areas in the Caserta Province

In relation to the proposed approach, the risk characteristics of the numerous ASI agglomerations located in the province of Caserta have been analyzed (Fig.18).
As for the factors of natural danger, the ASI settlement of Caserta shows no particular criticality. The various agglomerations are located, in fact, mainly outside the areas affected by phenomena of hydraulic danger and landslide, as identified by Adb Liri-Garigliano Volturno and reported in the national mosaicing prepared by ISPRA (2017) except for the agglomerations of Capua Nord and Capua Sud, which are, at least partially, in the area with the highest hydraulic hazard (P3) identified along the river Volturno. As for the seismic risk, the municipalities of the Province of Caserta, according to the seismic classification of the Campania Region (Delibera Giunta Regionale 5447/2002) are largely classified as seismic zone 2 at medium seismicity, with the exception of five municipalities in the north-east of the Province which fall within the area with the highest seismicity (zone 1) and three municipalities falling within the area 3 with low seismicity. Far more critical are the situations linked to the multiple anthropogenic hazard factors and the potential impacts they may have on human health and natural resources. The first aspect considered concerns the presence of companies at risk of major accidents (in Italian Aziende a Rischio di Incidenti Rilevanti - ARIR), or companies in which there are dangerous substances in quantities such as to exceed certain thresholds set by Legislative Decree 105/2015, in the Casertano ASI areas. Decree 105/2015 classified the ARIR in two types: upper-tier and lower-tier plants because of the quantity of hazardous substances treated or stored by the plant. The types of major accidents to which the presence of such companies could give rise are attributable to emissions of dangerous substances, fires or explosions: the ARIR can therefore give rise to events (emissions, fires or explosions) which cause immediate or delayed impacts to human health, to natural matrices (air, water, soil, vegetation), both inside and outside the plants. With reference to the study context, it should be noted that in the entire Province of Caserta, according to data provided by the ARPA Campania and updated in December 2020, there are 11 plants of lower threshold and 2 higher threshold: of these, 4 fall within ASI agglomerations and, in detail, 2 holdings (1 upper threshold and 1 lower threshold) fall within the agglomeration of Marcianise; 1 upper threshold holding falls within the agglomeration of Aversa Nord and 1 lower threshold company falls within the agglomeration of Volturno Nord. Further consideration has been given to both the presence of authorised waste management facilities (landfills), of which only 1 is located near the Aversa Nord ASI agglomeration; is the presence of sites subject to remediation and environmental restoration or potentially contaminated, identified on the basis of the tables of the Reclamation Plan of the Campania Region (https://www.arpacampania.it/web/guest/siti- contaminati). The presence of one or more types of anthropic risk (presence of ARIR, potentially contaminated sites and sites to be remedied) synthetically described have been one of the benchmarks for the identification of sample areas. Subsequently, the detailed surveys related to sample areas will allow to deepen, with regard to the ARIR, the degree of updating and the indications of the Safety Reports and Emergency Plans external and inter-

nal, aimed at preventing and dealing with major accidents; with regard to pollution phenomena (potential or in the process of remediation), the specific types of contaminants and the most impacted environmental matrices. Such surveys will provide the relevant support for the definition of nature-based solutions (European Commission, 2015) that can contribute, in a multi-objective perspective, to restore the functionality of highly degraded ecosystems such as those under consideration, to reduce the current pollution phenomena while responding to the growing demand for increased biodiversity, carbon storage, reduction of the impacts of climate change (extreme rain, heat waves, etc.) in urban areas (Dushkova and Haase, 2020).

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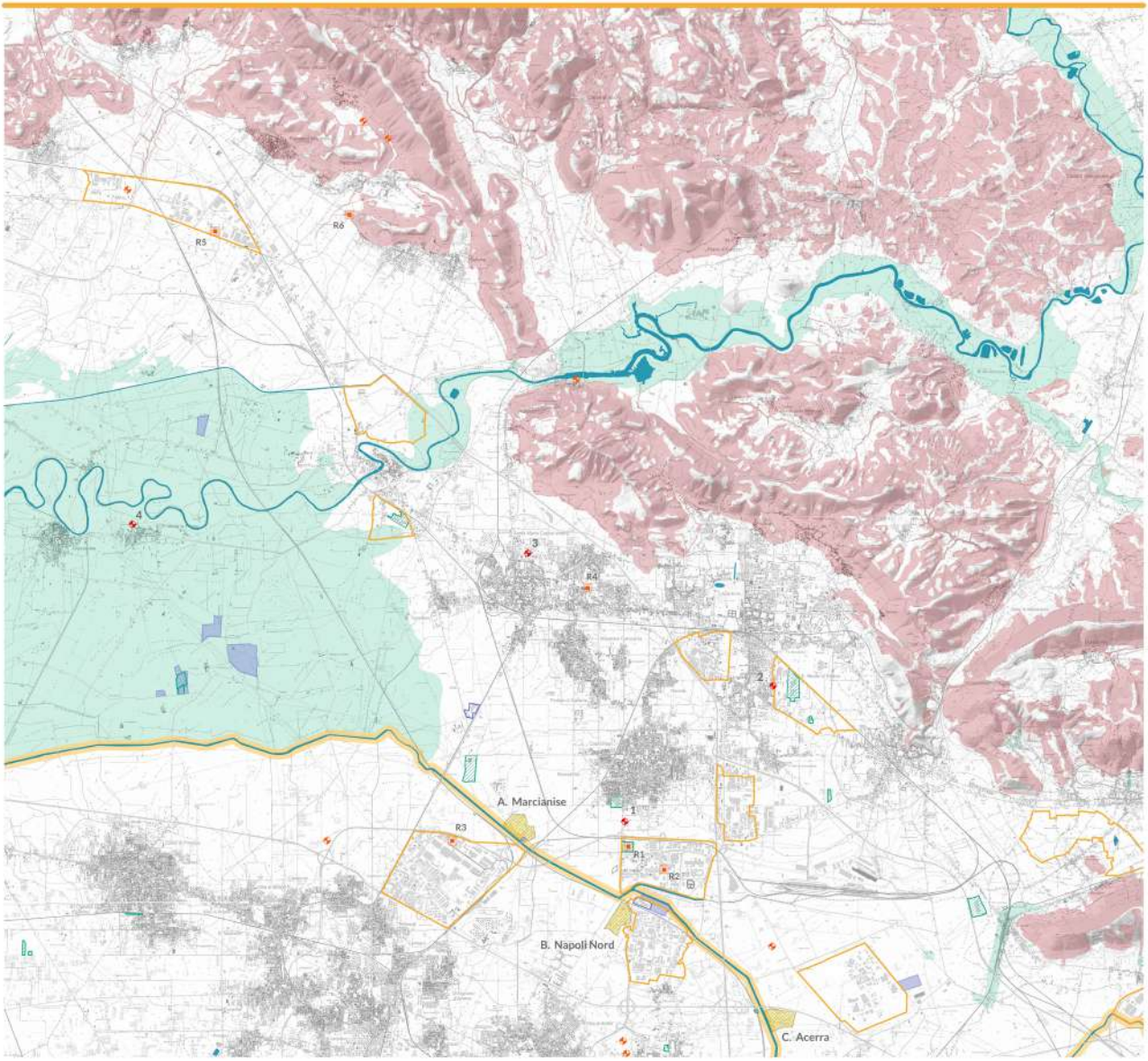
METROPOLITAN SCALE

CASE REPORT | INDUSTRIAL DEVELOPMENT AREAS



Legend | Risk - prone areas

0 2,5 5 10 Km

- Landslide risk
- Hydraulic risk
- Areas and elements linked to degraded waters
- Water bodies
- Productive sites
- Railways network
- Roads network
- Contaminated lands

Sites:

1. Sacchi - Municipality of Marcianise
2. Ex Mattatoio Comunale - Municipality of San Nicola la Strada
3. Ex Mattatoio Comunale - Municipality of Santa Maria Capua Vetere
4. Sant'Antonio - Municipality of Comune di Santa Maria la Fossa

- Potentially contaminated lands
- Scheduled sites for rehabilitation
- Sewage treatment plant

A. Marcianise
B. Napoli Nord
C. Acerra

- Waste processing plant
- Landfill sites
- Factories at major accident risk

R1. Eco-Bat Technologies
R2. Sol S.p.A
R3. Aversana Petroli
R4. GaffOil
R5. IGAT S.p.A
R6. Zippo Gas

Fig. 18 - *ASI Caserta: metropolitan scale map_Risk prone areas* | *Giovanni Bello, 2021*

Environmental issues and industrial landscapes

Adaptive strategies and Nature-based technologies for the regeneration of the fragile environments

Ecological environmental issues
Criticality and potential

Rossella Franchino

The study of water, air and soil matrices environmental conditions is necessarily the preliminary activity to any regeneration of degraded areas due to previous anthropogenic activities. The Italian territory is dotted with numerous sites previously used, for example as industrial areas, extraction areas, waste dumps, which represent a potential asset for new uses but necessarily subject to their rehabilitation. The presence of these areas, however, also constitutes a heavy environmental inheritance as very often previous anthropic activities have strongly compromised their ecosystem quality through the emission of pollutants which constitute a condition of considerable danger for the water, air and soil matrices. The consequences are even more worrying due to the fact that very often these sites are located near densely populated urban areas.
In this regard, to intervene on the development of the territory in order to find an alternative to the model that has been imposed in the last century, all interventions concerning the recovery and reuse of areas degraded by previous anthropogenic activities must necessarily be addressed, therefore, in view of the environmental resources rational and environmentally friendly use. For those who work in the environmental protection sector with particular attention to the issues of resource management in land recovery interventions, the optimization of performance and the search for reversible operating practices is the prerequisite for implementing the principle of intergenerational equity. The sustainable management of the environment, in fact, (Clini et al., 2012) necessarily implies a rational and environmentally friendly use of resources through the optimization of anthropic processes affecting the territory. The territory, in its complexity constituted by a set of architectural and functional relevance surrounded and interrelated with the matrices air, water and soil, must be configured, therefore, by technological interventions validated in a more general discourse of environmental compatibility. Furthermore, the general objective of environmental compatibility specializes in a series of particular objectives which essentially consist of the ability to detect the aspects of the natural and anthropic environment and to contain its transformations within the framework of safe sustainability.
Starting from these considerations and specifically with particular attention to the management of territorial resources in industrial areas, the current phase of research aims to provide useful insights for the identification of strategies to be used for the definition of eco-solutions for degraded and abandoned soils with reference to the case study of the ASI of Caserta.
It is of fundamental importance to customize case by case the necessary strategies and it is of absolute importance that the interventions are structured in close synergy with those of reuse of the areas. The cases that arise are many and clearly depend on both the previous use of the site and the new reconfiguration and can range from a divestment only functional type for a shift of activities in another place to divestments with implications of ecological and environmental type because of the previous use. In particular, the study focuses on the identification of transformation interventions structured in such a way as to:
• ensure the safeguarding of the quality of the various environmental matrices;
• remove all possible sources of pollution;
• reduce the concentrations of pollutants to a level below the acceptability levels established according to the legal limits and the future use of the land.
These interventions, moreover, in accordance with the above premises,

must be planned in such a way as not to disregard the purposes of recovery, the new functions of the site, the overall ecological reconfiguration and the means necessary to achieve it. It is very important, therefore, to customize the transformation intervention by identifying the necessary treatment systems on a case-by-case basis, favouring, where possible, the application of natural or small-engineered systems that, obviously, make the intervention itself even more environmentally effective. In this context, when the characteristics of the intervention allow it, particular attention is paid to the contribution of Nature-based Solutions (Kabish et al., 2017) (Brears, 2020) (Fig.19) with the aim of using the principles of nature as a model of sustainable management by stimulating the natural potential inherent in these resources and not developed due to massive anthropization. The Nature-based Solutions are also at the center of the interests of the European Commission which defines them as: "solutions that are inspired and supported by nature, which are cost-effective, simultaneously provide environmental, social and economic benefits and help build resilience. Such solutions bring more, and more diverse, nature and natural features and processes into cities, landscapes and seascapes, through locally adapted, resource-efficient and systemic interventions." (European Commission_ The EU and nature-based solutions). The advantages brought by the use of these solutions are many and in particular those relating to the improvement of environmental resilience and ecological conditions in order to preserve their biodiversity are highlighted. According to a study by ISPRA, "in fact, it has been shown that the loss of biodiversity contributes to food and energy insecurity, increases vulnerability to natural disasters, such as floods or tropical storms, decreases the level of health within society, reduces the availability and quality of water resources and impoverishes cultural traditions " (ISPRA 2010). The control of biodiversity (Padovani et al., 2009), with the consequent safeguarding of the natural processes underlying the survival of ecosystems, is one of the factors that most influences the current redevelopment interventions in a sustainable key of the urbanized territory. It is now known that the protection of biodiversity passes through the network connection of habitats, and more generally of natural areas, because it is in the fragmentation of natural environments, that is, in the gradual division of a basin of naturalness into ever smaller and more isolated fragments. due to the direct action of man, which must be identified as one of the most serious dangers for ecological diversity. In this regard, it is therefore necessary to intervene with appropriate mitigation and adaptation strategies that contribute to the improvement of ecosystem characters (von Haaren et al., 2019). This is for the purpose of conservation and redevelopment of the natural resources present in the area and the connection between the ecological and environmental values of the areas for an overall enhancement of the territory.

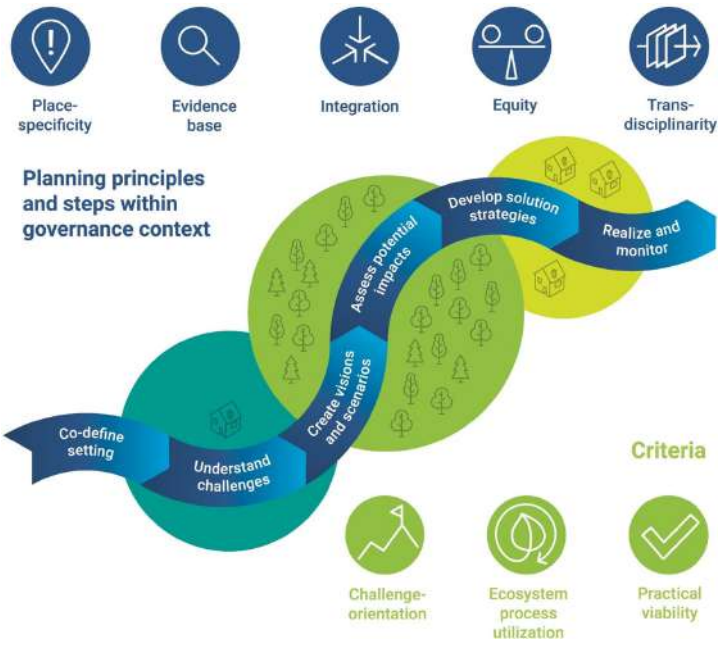


Fig. 19 - *Conceptual framework for NbS planning* | *Albert, C., Brillinger, M., Guerrero, P. et al., 2021*

Making technological and environmental (re)connection
A hypothesis of eco-innovative strategy

Caterina Frettoloso

Resilience as a "process to be built" means changing negative events into positive factors on which to build growth opportunities (Cyrulnik and Malaguti, 2005; Mezzi, Pellizzari, 2016). Within this process, the theme of quality of living plays a key role in the definition of strategies for the transformation of anthropized contexts in an adaptive key whose objective is to reduce land consumption, increase the ecological-environmental quality and promote diversity in functional, social and environmental terms.
Therefore, it is necessary to operate according to regenerative cycles able to activate transformation processes closely related to resilience through actions of adaptation of anthropized systems so that they increase their adaptive capacity in situations of anthropic and environmental criticality. "Cities today represent complex mechanisms, therefore the organisational model capable of responding to this complexity must be interactive, adaptive, reversible and moulded according to the inputs coming from the constant exchange with the environment: through micro-strategies for a sustainable reuse of the urban heritage it is possible to activate projects capable of contemplating the spatial transformation together with the social effects on local communities" (Gianfrate and Longo, 2017). Adaptive reuse is a strategy that responds to this need and allows for the creation of a connective fabric through interventions that may be punctual and carried out according to different temporal dynamics, i.e. intervening by progression. Open spaces constitute a strategic element of this connective fabric as an expression of the living quality of a given context and, therefore, can be understood as "a potentially flexible management element of the city [and, in general, of anthropized contexts], in relation to the uses and activities that take place in it and to the influences generated by the temporal and climatic factor" (Boeri, 2017). In a logic of reuse that involves two complex systems such as the city and the disused industrial areas, it becomes strategic to work not only to give back to the citizens significant parts of the territory but, above all, to make these areas nodal elements from the technological and environmental point of view of a wider system of interconnected spaces, identifying, when possible, particular areas able to achieve a real interconnection/overlap with the urban ecological and environmental network (Vitillo, 2010).
"The innovative approach related to the regeneration of wastescapes uses a new lens which is useful to observe and interpret the contemporary landscape. This new perspective focuses on relations among different territories, i.e., among people and their living environment. In this way, the regeneration of wastescapes involves a comprehensive approach which investigates the possibility of reconnecting formerly fragmented wastescapes in a well-connected network of regenerated lands" (Amenta et al., 2019). In this change of trend, open spaces, which are attributed the capacity to combine social, environmental and economic values, play a key role as nodal elements (not only in relation to fruition and comfort but also to cultural identity) in the activation of diversified regeneration processes at different scales of intervention. In this logic of transformation, the compromised areas can take on a new function in the socio-economic dynamics of the city: new poles of attraction, new connection systems, an increase in environmental quality and, last but not least, an increase in safety through a conscious and correct use of the recovered spaces. Paraphrasing the broader concept of "territorial networks", it is possible to reason according to a network logic of the open spaces of the macrosystem city - disused industrial areas as "a place of experimentation for energy efficiency on an urban scale, and for the mitigation of climate risks" (Gianfrate and Longo, 2017), in an attempt to provide dynamic responses to the "change in the ways and forms of mobility and accessibility. (...) [Recovering] the topological sensitivity and the intrinsic value of the soil not as a fragment or bucolic reserve, but as a structuring element" (Lanzi, 2014). This requires a reflection and, therefore, a design approach in which collective spaces

are not considered as isolated elements but as the core of a network of diversified open spaces meeting several needs. It is important to propose "models capable of controlling environmental system parameters related to the themes of usability/mobility, time of use and soil permeability, identifying the detractors in the critical elements that keep the areas as sites of waste, but proposing a new approach of urban and social regeneration, with their transformation into values and the recycling of the soil" (Nava, 2013). This methodological-design approach is centred on the concept of Eco-Innovation (Fig.20) as defined within the MEI project which, starting from the Oslo Manual's definition of innovation (OECD, 2005), is conceived as "the production, assimilation or exploitation of a product, production process, service or management or business method that is novel to the organisation (developing or adopting it) and which results, throughout its life cycle, in a reduction of environmental risk, pollution and other negative impacts of resources use (including energy use) compared to relevant alternatives" (Kemp and Pearson, 2008). Sharing this consideration, the idea on which we are working is configured as a hypothesis of an eco-innovative strategy and, therefore, pursues two significant objectives:
to re-cultivate the spatial and environmental fragmentation that characterises the areas subject to intervention by creating a system of open spaces conceived as a real infrastructure at the service of citizens;
to increase the ecological-environmental quality through a systemic use of "nature based solutions allows to integrate, with an organic perspective, transformation and management projects addressed to environmental, landscape and socio-economic components with the aim to increase urban resilience. (...) This is not a matter of activating what is defined simplistically "re-naturing" urban areas; it involves regenerating urban fabrics with logics that can improve their life cycle performances, also by utilising techniques based on the aware and planned use of natural elements" (Mussinelli et al., 2018). These macro-objectives relate reconnection strategies, again with reference to the MEI project mentioned above (Kemp, Pearson, 2008), to two types of eco-innovation "Environmental technologies" and "Green system innovations", in which environmental benefits are mainly related to the reduction of impacts and pollutants as well as to the responsible use of resources, especially non-renewable ones, according to eco-oriented approaches. In fact, the definition of eco-innovation commonly adopted, although widespread and shared, does not always manage to identify which strategies do or do not fall under this concept, therefore, in the field of research applied above all to the industrial field, the need for greater clarity has been felt. An interesting operational taxonomy that entails key types of eco-innovations reflecting their different roles on a greening market was

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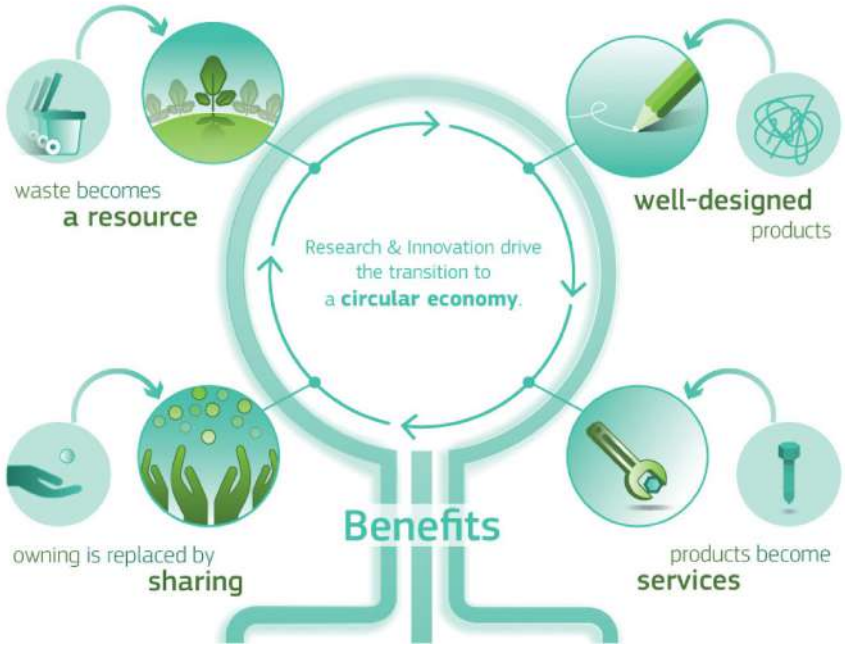

Fig. 20 - *Conceptual framework for Eco Innovation definition* | *European Commission-EC, 2012*

suggested by Maj Munch Andersen (Andersen, 2008) which introduces five categories of eco-innovations: Add-on eco-innovations, Integrated eco-innovations, Alternative product eco-innovations, Macro-organizational eco-innovations and, finally, General purpose eco-innovations.

Although the taxonomy has been suggested which are defined by the role these innovations play on the market, it could be useful to better identify the "reconnection strategies", trying to decline these typologies in relation to dynamics of adaptive reuse of compromised contexts.

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The choice of sample areas

A synthesis of the raised issues and verification of methodological assumptions

Giuseppe Guida

Following the methodological proposed and implemented approach, the historical-territorial analysis, ecological-environmental conditions and critical urban planning, have emerged some pieces of territory, framed in the most complex territorial system of reference (Fig.21) on which it seems more effective and useful to propose a multidisciplinary design experimentation.
As stated above, the urban project, in proposing to integrate different "state of conditions" (urban, productive, rural, infrastructural), is seen as the dimension of synthesis able to suggest regenerative hypotheses, as a background element on which to articulate policies, plans, programmes and, in general, the action of the public decision-maker (in the specific case, the Consortium, the Municipalities, the Region). The first of the three hypothesis of sample areas is the strip of territory that stretches from the urban fringe of Marcianise, near the former factory called Siemens, south to the industrial agglomeration "Marcianise". The aforementioned area, crossing agricultural areas intended, according to the current Regulatory Plan for public and sports equipment, the existing velodrome, a public park recently built but now in disuse, the SS 335 so called Asse Mediano, the elevated section of the railway (railway connection NA-CE interporto of Marcianise) some bands interstitial and pertaining of the agglomeration, reaches up to the polluted area of the Ecobat Spa (Fig.22), identified from the PRG of the municipality of Marcianise like homogenous zone D1 D2 D3 "Territory consisting of industrial agglomerations of the Industrial Development Area of Working Land or pre-existing industrial agglomerations".
Cobat chain is the largest lead producer and recycler in the world and one of its subsidiaries, in Italy, is Ecobat Spa, a company that has always been sensitive to the issues of sustainability and circularity. In 2013, the strong interest in environmental issues resulted in a project to secure a site closed to the industrial plant, of about 3,5 hectares, contaminated by heavy metals with a significant risk to human health caused by the dispersion into the air of particles of soil polluted by lead. The intervention, developed as part of the Life ECOREMED project, has primarily provided for the phyto-stability of industrial soils to combat the lifting of contaminated dust with the provision

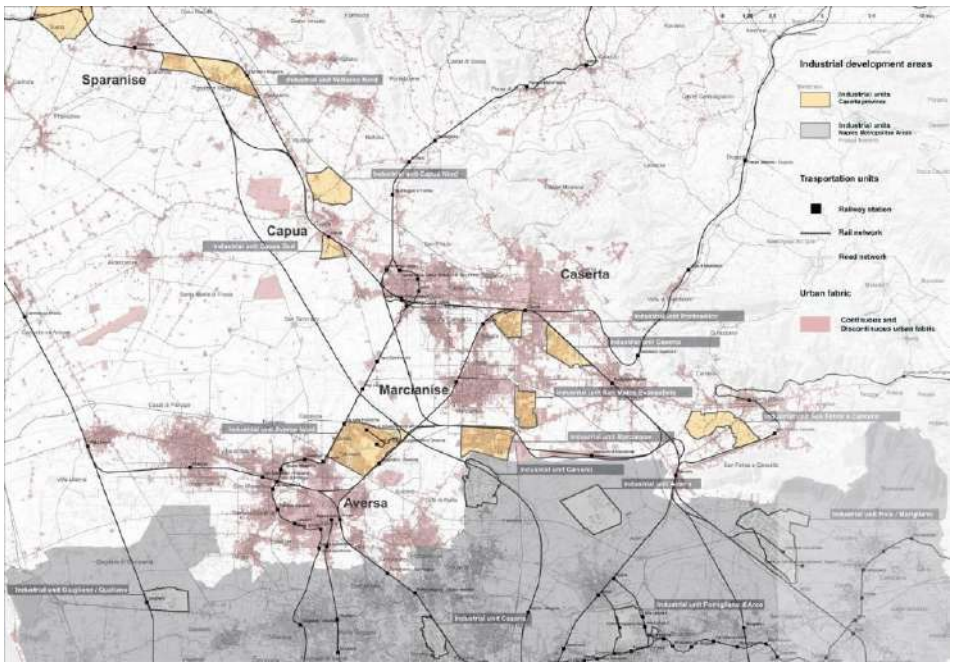


Fig. 21 - *Metropolitan scale. The ASI Caserta system* | *Giovanni Bello, 2021.*

Fig. 22 - *Marcianise sample area_Phytodepuration process in the EcoBat factory, 2017* | *Ph Anna Laura De Rosa, 2020.*

of a thick permanent turf cover. Subsequently, it was planned to plant a dense poplar, to reduce the wind speed and the consequent fallout and dispersion of polluting particles, and to initiate the process of phyto-purification and neutralisation with respect to the presence of heavy metals in the soil. Finally, a compost fertilisation process was applied to improve both plant growth and soil structure to counter dust fall. The process started to secure the site is strongly hinged on a circular logic. The compost used comes from the nearby factory in Salerno and is produced from the organic fraction of municipal solid waste. According to the same circular principle, at the end of the phyto-remediation process, the wood produced, and presumably contaminated, is used as a reducing agent in the furnaces, in place of petroleum coke, for the melting of batteries for the recycling of lead. The intervention therefore has a dual utility, on the one hand it implements the phytoremediation process also in order to limit the migration of contaminants to groundwater, on the other hand, it promotes the reconstruction of a natural environment and the restoration of biodiversity in a place that would otherwise have been further and irreversibly compromised.

In the area between the Velodromo and the Ecobat plant, the project so called "Green Ring" (Fig.23) is developed. Initially conceived as a green barrier to interpose between the industrial and residential areas to stem the potential pollution, the project as developed by the Department of Botanical Arboriculture and Plant Pathology, in 2007, was soon filed. The Municipality of Marcianise therefore decided to make a variant of the same project, providing for the construction of a public space with playground at the service of the city (Fig.24). Subsequently, the ARPAC set up drilling rigs on the ECOBAT soil and on the areas surrounding the plant, and the playground area was also polluted and therefore closed.

Divided and sold to various companies and entities, and used for illegal waste management activities by companies that had operated since the 70s, the area is currently in degradation and abandonment conditions and, following drilling carried out in 2015, the presence of industrial and polluting waste has been found in soil and groundwater. In 2017, following the resolution of the Regional Council of 1 August n. 250, an agreement was signed between the Campania Region and Invitalia to undertake characterization, safety and remediation of the site.

From the former Pozzi-Ginori, continuing and crossing the agglomeration, you arrive near the building Offices Ex Manifattura Pozzi (Fig.25), now owned by the municipality of Sparanise and bound pursuant to Law 1089/1939 art.1 in the matter of "Protection of things of artistic and historical interest" and from here to Via Appia, SS7.

The second hypothesized area crosses the municipality of Sparanise, that of Calvi Risorta and the agglomeration "Volturno Nord". In the latter, in particular, is located the potentially polluted area called "Ex Pozzi-Ginori" , included in the register of potentially contaminated sites (ARPAC data, 2016).

Fig. 23 - *Marcianise sample area. Green Ring Project, 2007* | *University of Naples Federico II, Department of Botanical Arboriculture and Plant Pathology*

Fig. 24 - *Marcianise sample area (with the ASI Agglomerate on the border). Closed and never used playground area due to pollution problems* | *PURE Research Team, 2021*

Fig. 25 - *ASI Caserta_North Volturno Agglomerate_Industrial Complex Pozzi* | *Ph Giuseppe Guida, 2020*

Fig. 26 - *ASI Caserta_Caserta-Agglomerate_Former glass factory Saint Gobain, 1960* | *Derive suburbane, 2018*

Going west, and crossing the town of Sparanise, intercepts a varied territorial mosaic, characterized by the presence of abandoned and/ or degraded and/ or underused or improperly used, interstitial agricultural plots, until it reaches the former quarry called "Calce Idrata" (61089-03, PRAE 2016), currently used improperly and illegally as a landfill of waste and in whose environmental matrices and included among the sites potentially contaminated in the Regional Plan for the reclamation of polluted areas of the Campania Region.
The third area hypothesized falls in Caserta in the wedge that develops to the south-east of the city, on which they insist the former industrial area Saint Gobain (Fig.26) with one of the best known findings of industrial archeology bell originally aimed at the production of glass, the landfill called "The Uttaro" for which an intervention has been prepared for the safety of the aquifer, and the former municipal slaughterhouse, in which the interventions of sampling, preselection, loading and transport of special waste and subsequent remediation have been entrusted, by means of a recent call for tenders, to Invitalia - National Agency for Investment Attraction and Development of enterprise S.p.A (in italian Agenzia nazionale per l'attrazione degli investimenti e lo sviluppo di impresa S.p.A).

Territorial and urban regulatory Plans
The research has previously collected and systematized the rule of law of the territory determined by the various plans, town planning and sector, which insist on it.
Specifically were taken into account: the Regional Territorial Plan (in italian Piano Territoriale Regionale - PTR) and the Territorial Plan of Provincial Coordination (in italian Piano Territoriale di Coordinamento Provinciale - PTCP) of the study areas and the General Regulatory Plans (in italian Piano Regolatore Generale - PRG) of the municipalities in which the study areas fall.

Planning strategies and eco-innovative solutions for the new lands

Designes examples for the three sample study areas

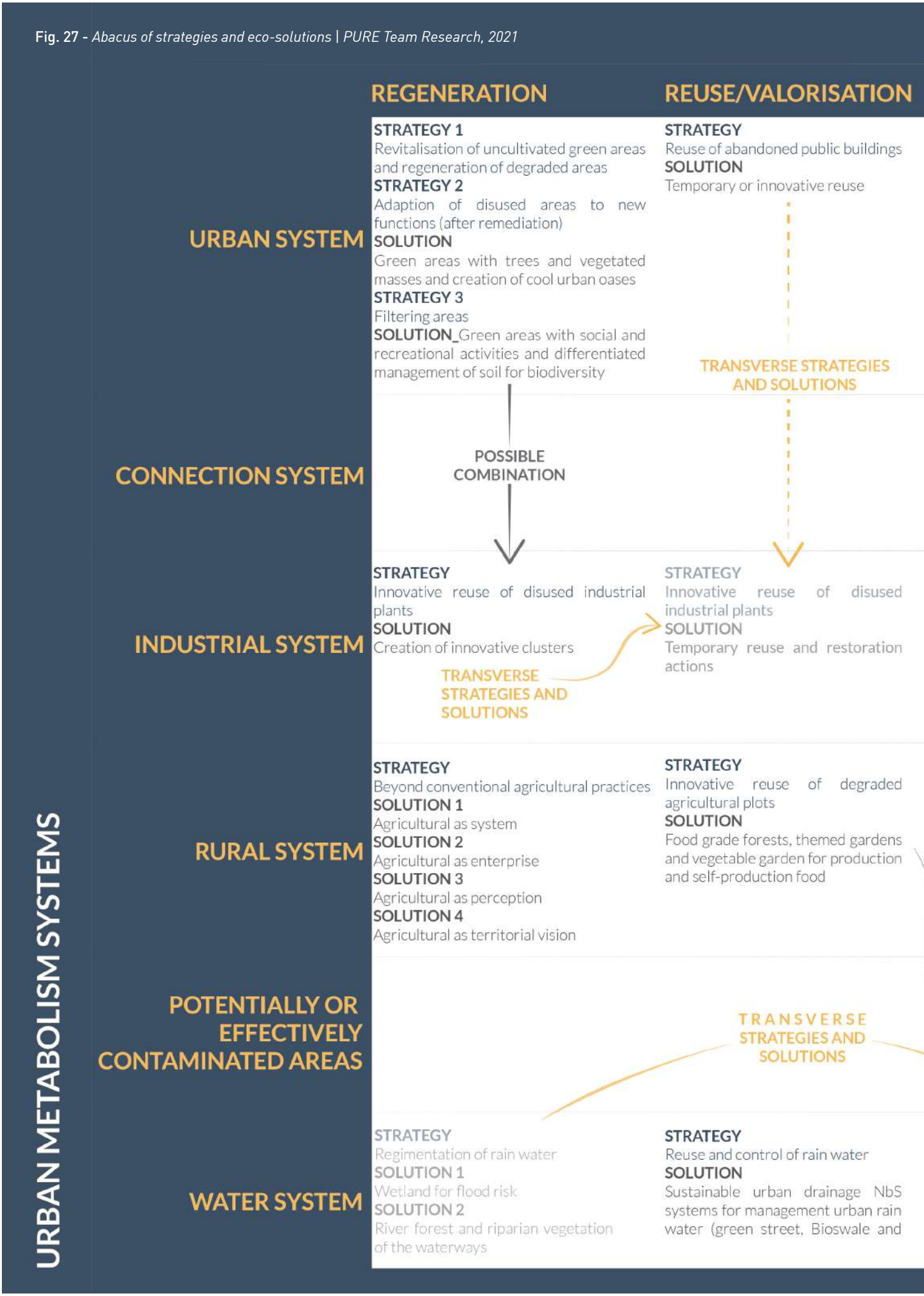
Giuseppe Guida and Valentina Vittiglio

As we have seen, large industrial areas are territories characterized by the coexistence of identities, functions and prospects of the future, which are different and often contradictory, in which the large industrial "plates" contend the territory with urban tissues, rural areas, large infrastructure and powerful signs of "historical palimpsest".
As stated above, for this "region", located in we have already coined Campania in the South of Italy and known at the time of the Romans as "Campania Felix", the research coined the image of the "oil city", in which different entities contend the territory, without dialogue and in the absence of common strategies.
For these territories, the question is not only the classic one of the regeneration of the abandoned industrial areas, but rather that of the governance of a complex process which, on the one hand, regenerates the permanently abandoned buildings, while on the other, reflects on the industrial question according to an innovative and ecologically equipped approach, making the large industrial slabs become integral parts and not in contradiction with the great urban conglomerate that has been generated since the second half of the 20th century from Naples to lower Lazio.
The process of the analysis and knowledge of the places and the definition of the strategies, elaborated by the PURE research, is part of this critical territorial condition trying to "disassemble" it by hypothesizing possible solutions. Of this complex path, this report exposes, in a critical way, the part of the reading and knowledge of the territory necessary to develop the subsequent phases through masterplans on specific samples areas, which represents an area of urban transformation, a sort of "infiltration" of the city in the ASI platforms.
Therefore, scenarios and visions have been developed that, starting from a regenerative dimension of the urban project and through the use of eco-innovative design practices, provide tools for the development of urban policies and tools, specific for some areas but with the ambition of being replicable in similar situations and contexts.
The main objective has been therefore that to hypothesize a reversal of course that, starting from latency conditions of the selected marginal contexts, reinterprets the great areas abandoned and "waiting" (both industrial, and relative to the near urban tissues) placing them in a circular perspective, in which the recovery and reuse of soil, the enhancement of artifacts sometimes valuable, the rethinking of the infrastructure network and the provision of new green areas or reclamation (or, better, in specific cases, the safety with respect to recognized conditions of pollution) of the existing ones, have been indispensable priorities and directed to define new conditions of environmental and urban quality.
The entire research path is then synthesized in design experiments in what have been defined sample areas that find their synthesis in the masterplan.From the point of view of the urban project, these scenarios are primarily aimed at generating a new public space of quality, functional and interconnected. Powerful tools through which to redefine the role of industrial areas, urban contexts and rural and naturalistic identities of these territories.
The chapter then collects the design strategies developed for the three sample areas of Marcianise, Caserta and North Volturno.

New lands. Methodologies for a project
As previously mentioned in the paragraph"Methodological Framework. From analysis to project", the methodological process has as output the elaboration of EIS or Nbs taken from the literature, then also experimental, or already implemented in urban contexts with characteristics similar to those surveyed. The development of the solutions starts from the identification of recurrent elements on the investigated territory and synthesized in "systems" of the urban metabolism (urban fabric, connections, industrial fabric, agricultural plots, potential or effectively polluted areas, water system) of the investigated territories.
With respect to these systems, the research identifies for each of them guidelines that can be translated op-

erationally and subsequently in some EIS or NbS. In particular, the action for the first "urban fabric" system, in addition to providing restoration and integration between the consolidated city and the surrounding suburban landscape, have been oriented to the prediction of measures to stem the presence of the polluting component due to the proximity to the industrial plate. In this sense, in addition to the provision of soft mobility, through the provision of cycle/pedestrian paths, further mitigating measures have been considered with the aim of reorganizing and implementing the green component in these places. Therefore, in addition to the prediction of vegetative or mixed systems (plant and artificial ones), also with the function of controlling the visual permeability with respect to the industrial manufactured products, concealing the view on the obsolete and enhancing those of significant architectural value, the green areas (public, uncultivated, agricultural) have also been reconnected through the provision of green corridors, equipped filter areas and the enhancement of abandoned plots.
The second "connections" system, in addition to contemplating a hierarchization of vehicle, bicycle and pedestrian flows within and around industrial areas, ave been oriented towards the introduction of active technologies aimed at the production of kinetic energy and ecological environmental connections.
Within the "industrial fabric" system, in addition to the visual permeability control solutions mentioned above, there are also solutions for the mitigation of acoustic impacts through the insertion of integrated shielding systems, which are made with both plant and artificial elements (such as a vertical mobile garden or green noise barriers), with the expected innovative reuse, even temporary, of the industrial plants of a particular value.
The "agricultural plots" system refers to the dense texture that creeps between the urbanized and the industrial plate. In relation to these areas, the research proposes a rethinking of the same in regenerative terms, going beyond the concept of agriculture as a practice aimed at the mere production of primary goods and declining it in systemic terms as a link between the place of production and the system of territorial relations that make it a resource; in entrepreneurial terms, this is through the activation of innovative farms; in perceptive terms, this is with respect to the value that the agricultural soil can have if it is related to concepts such as short chain and km0 production; in terms of the territorial vision, this is promoting integration between agriculture, production and multifunctionality.
The more complex system "potential or effectively polluted areas" provide the introduction of remediation strategies favoring those nature-based where possible (such as phytomedia), integrated interventions (hard and soft) in conditions that are more compromised, promoting at the same time the perceptual recomposition of the landscape, in an improvement key.
The latest "water" system insist on the use of solutions aimed at the decontamination of water (such as the creation of wetlands), as well as the control, collection and reuse of meteoric water through the predisposition of green streets, bioswales and raingardens.
The research, for a clear return of the strategies and solutions elaborated and identified for the three sample areas of study, has produced an abacus in which for every system of the urban metabolism, specific actions correspond to be implemented (regeneration, reuse/valorisation, reconnection, mitigation). Each action involves specific eco-innovative strategies and solutions to be applied in the contexts investigated and sometimes transversal with respect to the different systems of metabolism. In addition, the abacus also provides a collection of best practices taken from the literature or already tested (Fig.27). Below is deepened what the abacus returns in a synthetic key.

Fig. 27 - *Abacus of strategies and eco-solutions | PURE Team Research, 2021*



ACTIONS

RECONNECTIONS

STRATEGY 1
Upgrading of existing road network
SOLUTION
Cycle and pedestrian routes for slow and shared mobility
STRATEGY 2
Ecological and environmental reconnections
SOLUTION
Desealing areas and new afforestation and vegetation

TO BE RELATED TO

STRATEGY
Hierarchisation of flows
SOLUTION
Development of sustainable solutions for public transport and ntroduction of active technologies for the production of kinetic energy

TRANSVERSE STRATEGIES AND SOLUTIONS

STRATEGY
Hierarchisation of flows
SOLUTION
Development of sustainable solutions for public transport and ntroduction of active technologies for the production of kinetic energy

TO BE RELATED TO

POSSIBLE COMBINATION

STRATEGY
Safety measures or sustainable and adaptive remediation
SOLUTION 1
Soft remediation
SOLUTION 2
Hard remediation

STRATEGY
Regimentation of rain water
SOLUTION 1
Wetland for flood risk
SOLUTION 2
River forest and riparian vegetation of the waterways

MITIGATIONS

STRATEGY
Mitigation of harmful emissions and dust
STRATEGY
Inspection of visual permeability of limitation systems
SOLUTION
Green shielding or hybrid systems
SOLUTION
Urban forest

TRANSVERSE STRATEGIES AND SOLUTIONS

STRATEGY
Ecological and environmental reconnections
SOLUTION
Green corridors and greenways

TO BE RELATED TO

STRATEGY
Mitigation of harmful emissions and dust
STRATEGY
Inspection of visual permeability of limitation systems
SOLUTION
Green shielding or hybrid systems
SOLUTION
Urban forest

TO BE RELATED TO

BEST PRACTICES

Urban Forests Case Studies
https://issuu.com/americanforests/docs/af_urbanforestscasestudies_final_web_test/111
CAR:MEN_Casoria Remix. Motion, Energy, Nature for rethinking Wastescapes
https://urbact.eu/sites/default/files/media/casoria_gebundeld.pdf
SOLAROAD
https://en.solaroad.nl/
DEQUINDRE CUT GREENWAY IN DETROIT
https://www.livinthehighline.com/urban-greenways/dequindre-cut/
WEST TORONTO RAILPATHS
https://www.railpath.ca/
Green noise barriers
thinknature_handbook_final_print_0.pdf; http://eskyiu.com/linear-landscapes/
Vertical mobile garden
thinknature_handbook_final_print_0.pdf; https://www.urbangreenup.eu/solutionsnn/green-covering-shelters.kl
De Ceuvel
https://deceuvel.nl/nl/; https://www.metabolic.nl/projects/de-ceuvel/
Re-Compost Land. Short supply chain of organic waste
http://h2020repair.eu/wp-content/uploads/2019/10/Deliverable-5.3-Eco-Innovative-Solutions-Naples.pdf
AGRICOLUS. The platform for precision agriculture
https://www.agrifood.tech/precision-farming/innovazione-digitale-e-sostenibilita-nellagricoltura-di-precisione/; https://www.agricolus.com/
Reuse of empty glasshouses
http://h2020repair.eu/wp-content/uploads/2019/03/Deliverable-5.2
RECALL: REmediation by Cultivating Areas in Living Landscapes through phytotechnologies
http://h2020repair.eu/wp-content/uploads/2019/10/Deliverable-5.3-Eco-Innovative-Solutions-Naples.pdf
C.A.N.A.P.A.
http://h2020repair.eu/wp-content/uploads/2019/10/Deliverable-5.3-Eco-Innovative-Solutions-Naples.pdf
SA.T.I.V.A.: SAve a Territory Increasing the Value of Agriculture
https://www.livinthehighline.com/urban-greenways/dequindre-cut/
IL BOSCO IN FABBRICA_ECOREMED RESEARCH PROJECT
www.ecoremed.it; http://www.ecoremed.it/index.php?option=com_content&view=article&id=171%3Ail-bosco-in-fabbrica&catid=44%3Aafter-life-activities&Itemid=73&lang=en
Gowanus Canal Sponge Park
https://dlandstudio.com/Gowanus-Canal-Sponge-Park-Masterplan
Raingardens
https://www.urbangreenup.eu/solutions/rain-gardens.kl
Bioswale
https://www.urbangreenbluegrids.com/measures/bioswales/

URBAN SYSTEM

REGENERATION

STRATEGY 1_Revitalisation of uncultivated green areas and regeneration of degraded areas

STRATEGY2_Adaption of disused areas to new functions (after remediation)

SOLUTION_Green areas with trees and vegetated masses and creation of cool urban oases

The solution is applied mainly in the interstitial and degraded areas of the urban center, in existing public spaces and in connection with the green axes of prediction. The increase in tree cover and shaded areas allows you to create a cool oasis to ensure multifunctional use, the attractiveness of open public space and the maximization of benefits on the urban environment.

STRATEGY 3_Filtering areas

SOLUTION_Green areas with social and recreative activities and differentiated management of soil for biodiversity

Creation of public parks and facilities, arable areas, prediction of passive water strategies in the junction areas between the urban, agricultural and industrial systems.

REUSE/VALORISATION

STRATEGY 1_Reuse of abandoned public buildings

SOLUTION_Temporary or innovative reuse

The solution provides, in a circular perspective, the reuse and the consequent valorization of the public abandoned real estate to previous industrial vocation or however of value for the insertion of new temporary, cultural or recreational functions.

RECONNECTION

STRATEGY 1_Upgrading of existing road network

SOLUTION_Cycle and pedestrian routes for slow and shared mobility

Reduction of the vehicular road section to facilitate the insertion of slow mobility routes (cycle/ pedestrian). Reduction of road section also creates free spaces which may be depavimented and used for the green road, with rain gardens, or planting trees for shade. The pedestrian and cycle paths can be made with material with high drainage capacity.

STRATEGY 2_Ecological and environmental reconnections

SOLUTION_Desealing areas and new afforestation and vegetation

The previous solution helps to trigger forestation actions along the roads to mitigate the microclimate and the impact of climate-altering emissions together with desealing to give greater permeability to the soil (as in the case of parking areas, squares, roadsides, extended waterproof and disused areas), thus increasing the areas of lamination (hydraulic invariance) and lamination and infiltration (hydrological invariance). The action of desealing involves vegetalization of the soil that act as sustainable urban drainage systems (rain gardens, floodable ditches, wooded areas of infiltration, etc...

MITIGATION

STRATEGY 1_Mitigation of harmful emissions and dust

STRATEGY 2_Inspection of the visual permeability of limitation system

SOLUTION 1_Green shielding or hybrid systems

The solution ensures the mitigation of noise and polluting particles through barriers composed of artificial and natural elements. It also allows on the one hand to limit the visual impact in the vicinity of industrial plants or dilapidated urban conditions and on the other ensure visual permeability in the presence of industrial manufactured products or conditions of particular urban/architectural value.

SOLUTION 2_Urban forest

The urban forest plays a role of protection of the town, of regulation of dust and noise, as well as contributing to the services of regulation of heat and water and cultural services of use. It is installed near or inside the city, in green areas with urban park or in linear form near roads with heavy traffic and ancient walls. The parks with urban woods are made up of natural and semi-natural vegetation structures, similar to the woodlands. The urban woodland systems provide very simple semi-natural landscaping schemes, with low plant and maintenance costs, which tend over time to have a spontaneous configuration.

CONNECTION SYSTEM

RECONNECTION

STRATEGY_Hierarchisation of flows

SOLUTION_Development of sustainable solutions for public transport and introduction of active technologies for the production of kinetic energy

The hierarchisation of flows, which should be applied above all in the industrial areas, is based on shared and more sustainable public transport systems (car pooling, car sharing, van pooling) to discourage the use of cars. In addition, the prediction of active technologies for the production of kinetic energy in electricity allows the latter to be used to maintain the ecological forecasting network along infrastructure.

MITIGATION

STRATEGY_Ecological and environmental reconnections

SOLUTION_Green corridors and greenway

The mitigation action is resolved by providing greenways to achieve both recreational and ecological benefits. In addition to encouraging a more sustainable mobility of connection between natural, agricultural, landscape, historical and cultural resources and inhabited areas, they allow the enhancement and redevelopment of natural resources, the promotion of sustainable development, the recovery of degraded landscapes.

INDUSTRIAL SYSTEM

REGENERATION

STRATEGY_Innovative reuse of disused industrial plants

SOLUTION_Creation of innovative clusters

The solution involves rethinking the industrial area through the systematization of the critical issues identified, generating new green infrastructure made of public space, new equipment, slow mobility routes, residential wedges, enhancement of agricultural areas and areas for temporary and informal uses. A system able, in the medium-term, to re-knit and partially merge the industrial agglomeration with the surrounding urban fabric, making it an integral part of a single urban system.

RURAL SYSTEM

REGENERATION

STRATEGY_Beyond conventional agricultural practices

SOLUTION 1_Agriculture as system

Foster the connection between between the place of production and the territorial relations that make it a resource;

SOLUTION 2_Agriculture as enterprise

Provide strategic and innovative farms to safeguard the productive unit and the integrity of the agricultural territory. This is where the so-called precision farming comes in precision agriculture, defined by the International Society of Precision Agriculture as "management strategy that gathers, processes and analyzes temporal, spatial and individual data and combines it with other information to support management decisions according to estimated variability for improved resource use efficiency, productivity, quality, profitability and sustainability of agricultural production" makes use of technological progress for the formulation of production scenarios in agriculture in order to optimise natural resources in rural production. The regeneration of abandoned and degraded green areas, the subject of this project, could return in an innovative perspective the historical rural vocation of the areas of interest examined.
The use of the methodologies of precision agriculture itself, already scientifically tested and validated in international contexts, would allow to enhance the agricultural resource of the Caserta territory. In particular, the first analyses carried out in the GIS environment, which not only return the current reality of the places but already identify priorities for intervention, could be the starting point for the planning of interventions for the redevelopment of agricultural soils and crop planning. Georeferenced data in GIS environment could be constantly implemented by images of the territory that return its state of health over time.
Agricultural soils mapping would in fact allow to plan over time the interventions and crops as indicated in the literature as "four-level-field-management" (S. Shibusawa, 2018). These levels define not only four temporal phases but also four moments of different deepening of agricultural practice. Specifically, the first level defines the spatial-temporal variability of agricultural soils as well as the

relationship between production yield and quality of the production itself; the second level describes and processes data in relation to farmers' experiential data, environmental conditions and production time series; the third level supports decisions in order to increase the yield of agricultural production, evaluating the quality and quantity of production also in relation to production costs; the fourth and last level, finally, defines and evaluates the actions in relation to the organization of workers and machinery employed.
Precision agriculture can also make use of digitized historical cartographic data and aerial photographs that can be analyzed, integrated and managed in parallel with contemporary data. In addition, a further advantage derives from the use of open-access satellite data, in particular multispectral ones, which by returning the electromagnetic response of the elements in the landscape (vegetation, rocks, anthropogenic phenomena, water bodies) also offer an assessment of the state of health of the soil. The research, specifically, makes use of satellite data from the Copernicus Program of the European Commission in partnership with the European Space Agency (ESA) which has put into orbit 12 satellites called "Sentinel" for Earth and environmental observation. By means of this satellite fleet, the Sentinel-1 (microwave) and Sentinal-2 (optical) satellites provide valuable information on agricultural crops. Due to their high temporal frequencies (from 5 to 6 days of repetition) and spatial resolution on the ground of the data (from 10 to 20 m) continuous monitoring of the state of agricultural crops becomes possible. The open data policy offers great opportunities for the operational integration of remote sensing data, possibly with others from other sensors, in agricultural practice.

SOLUTION 3_Agriculture as perception
Recognise the value of agricultural soil that influences interaction with the urbanised environment: short supply chain, direct sales, km0 products, etc...;

SOLUTION 4_Agriculture as territorial visions

Promote the integration between agriculture, production and multifunctionality: peri-urban parks, system of social gardens, etc...

REUSE/VALORISATION

STRATEGY 1_Innovative reuse of degraded agricutura plots

SOLUTION_Food grade forests, themed gardens and vegetable gardens for production and self-production food

Green areas for food production or self-production include different types of spaces and habitats: 1) edible forests, forest ecosystems in which are found on multiple layers herbaceous plants, shrubs and fruit trees. The latter are on the upper floor, while below there are edible berry shrubs, perennial and annual plants, which together form an ecosystem able to obtain high food production with little maintenance; 2) local vegetable gardens for self-production; 3) non-intensive agricultural areas for strengthening the production of quality vegetables and fruit in agricultural wedges and peri-urban areas; 4)theme gardens and flower gardens to enhance biodiversity. This system of green areas perform important eco-systemic services for the production of food at the service of the city, but also contribute to promoting biodiversity and pollination services, as well as promoting cultural services of wheat, of identity and sense of belonging and psychophysical well-being of the population.

POTENTIALLY OR EFFECTIVELY CONTAMINATED AREAS SYSTEM

MITIGATION

STRATEGY_Safety measures or sustainable and adaptive remediation

SOLUTION_Soft remediation

In which to favor Nbs and techniques such as bio and phyto-rimediation, using for example local agronomic species. The use of Nbs allows the multipurpose and temporary use of sites as well as ensuring the perceptual recomposition of the landscape, reducing its fragmentation.

SOLUTION_Hard remediation

In which to adopt remediation techniques as integrated phyto-remedy or in extreme cases other more invasive ones, to be declined in a logic adaptive to the context.

WATER SYSTEM

REUSE/VALORISATION

STRATEGY_Reuse and control of rain water

System for the control of rain water at the territorial scale

SOLUTION_Sustainable urban drainage NbS system for management urban rain water (Green street, bioswale and rain garden)

Sustainable Urban Drainage Systems (SUDS) and Nature-Based Solutions (NBS) combine green and blue infrastructures to manage the collection of urban rain water through natural, vegetated and floodable elements. The solutions concern the creation of rain gardens, flooded ditches, wet gardens and wells and trenches infiltrating squares and parks. These systems play an important role: during heavy rains they support and support the normal sewerage system that tends to saturate and promote the infiltration of the water of the first rain, purifying them through roots and soil that retain and/or degrade pollutants. Nature-based urban drainage systems can be integrated into residential areas and public spaces, but also in parking and craft areas in compliance with water regulations first rain and leaching.

MITIGATION

STRATEGY_Regimentation of rain water

System for the control of rain water at the territorial scale

SOLUTION 1_Wetland for flood risk

As for water bodies, some of the pilot areas are crossed waerways characterized by significant pollution both for water and riparian belts. The action could provide nature-based solutions by initiating phyto-depurative processes within extra-humid areas that removes water to prepare also a use for irrigation for agricultural fields in the surroundnig areas.

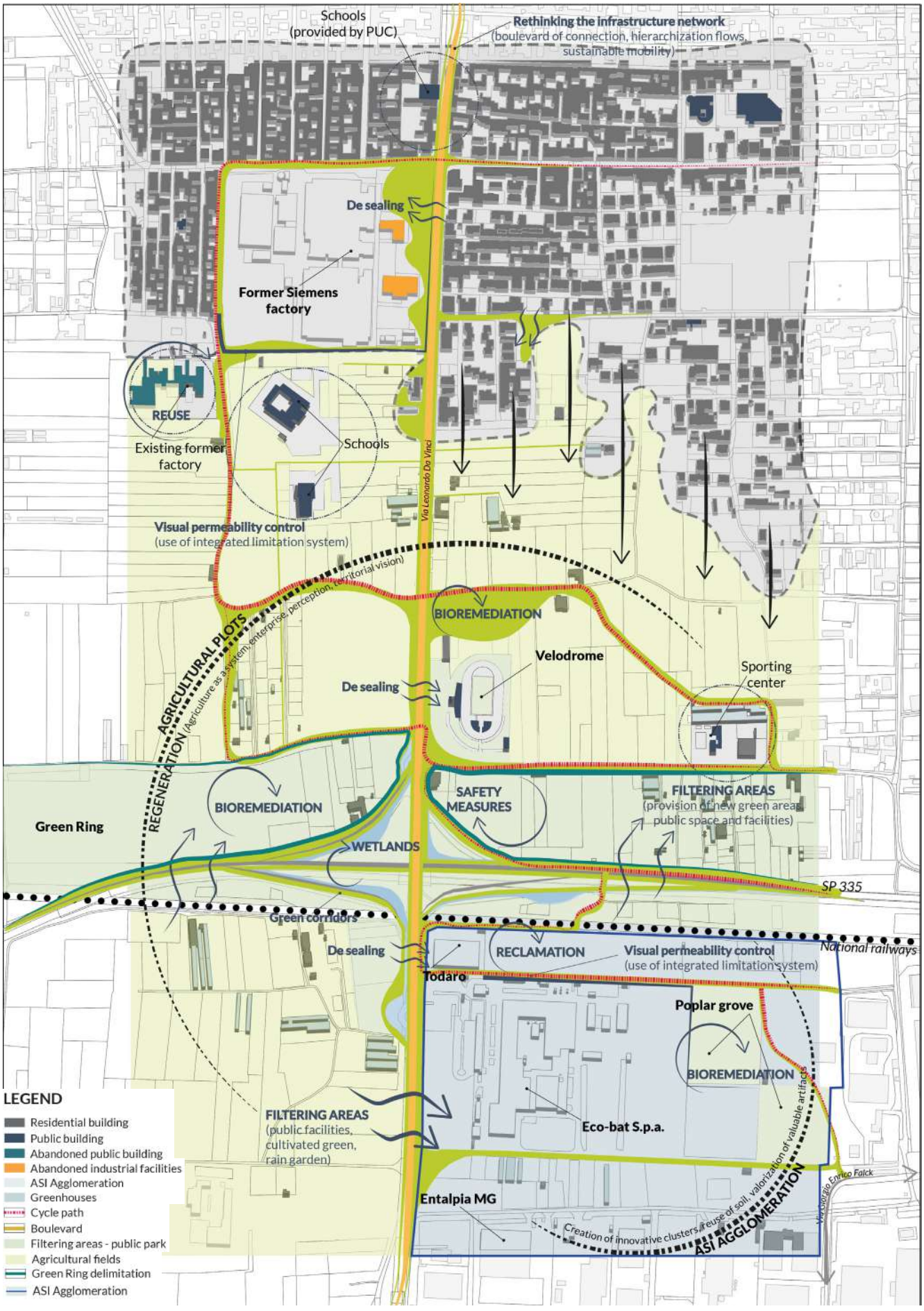
SOLUTION 2_River forest and riparian vegetation of the waterways

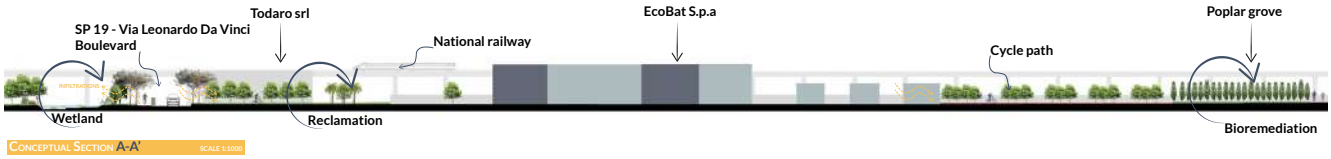
They are systems that produce heat regulation services, through water, dust reduction, food and biomass production and cultural services of use. These wooded bands have a linear or areal parallel and/or adjacent to the water streams and constitute a vital space for numerous riparian animal and plant species as well as environments useful for human enjoyment, for sport, leisure, entertainment and for educational activities. It is useful to associate with these wooded areas, where possible, wetlands able to attract animals and protected species. Compared to cement banks it is possible to restore natural and semi-natural shores.

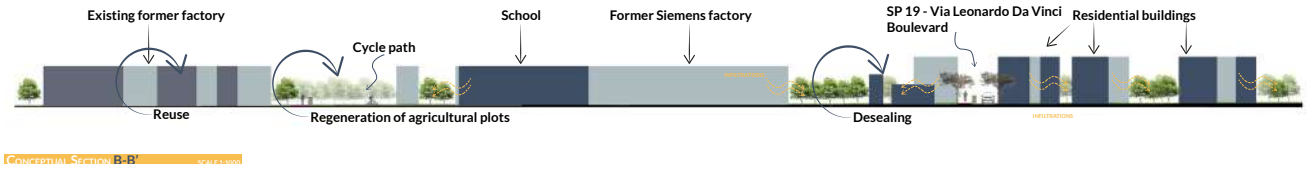
Marcianise sample area
A proposal for urban regeneration

For the sample area of Marcianise the analysis of the places returned the condition of a mosaic of "urban facts" located along the axi via Leonardo Davinci-SP19, now partly also used as an unstable linear public space and that in vision design should become the plug through which to activate a series of urban activities and services, and also pierce the shell of the agglomeration industrial. The axis, from north to south, intercepts: the urban fabric of Marcianise, the artifacts of the former Siemens, the State Institute of Higher Secondary Education "Father Salvatore Lener", large agricultural areas still active, a polluted land (according to data Arpac), the Velodrome, a public park completed but remained closed due to problems related to soil pollution and part of the project of the municipality of Marcianise called "Green Ring" (a band green equipped and eco-systemic services ever implemented), via Trentola (which leads to the famous "Pietra di Trentola"), the axis of SP335 (Median Axis) and its junctions and, finally, the industrial agglomeration ASI Caserta "Marcianise", in particular the area of Ecobat Spa and polluted soils of about 35,000 square meters, object in 2017 of an interven-

ASI Caserta - Marcianise Agglomerate: sample area project_ Concept | *Giuseppe Guida, 2021.*


Schools
(provided by PUC)
Rethinking the infrastructure network
(boulevard of connection, hierarchization flows, sustainable mobility)
De sealing
Former Siemens factory
REUSE
Existing former factory
Schools
Via Leonardo Da Vinci
Visual permeability control
(use of integrated limitation system)
AGRICULTURAL PLOTS REGENERATION
(Agriculture as a system, enterprise, perception, territorial vision)
BIOREMEDIATION
Velodrome
Sporting center
De sealing
Green Ring
BIOREMEDIATION
SAFETY MEASURES
FILTERING AREAS
(provision of new green areas, public space and facilities)
WETLANDS
SP 335
Green corridors
De sealing
RECLAMATION
Visual permeability control
(use of integrated limitation system)
National railways
Todaro
Poplar grove
BIOREMEDIATION
Eco-bat S.p.a.
FILTERING AREAS
(public facilities, cultivated green, rain garden)
Entalpia MG
Creation of innovative clusters, reuse of soil, valorization of valuable artifacts
ASI AGGLOMERATION
Via Giorgio Enrico Falck
LEGEND
Residential building
Public building
Abandoned public building
Abandoned industrial facilities
ASI Agglomeration
Greenhouses
Cycle path
Boulevard
Filtering areas - public park
Agricultural fields
Green Ring delimitation
ASI Agglomeration





On the top page: ASI Caserta - Marcianise Agglomerate_ sample area planning strategy - sections | *Valentina Vittiglio, 2021*

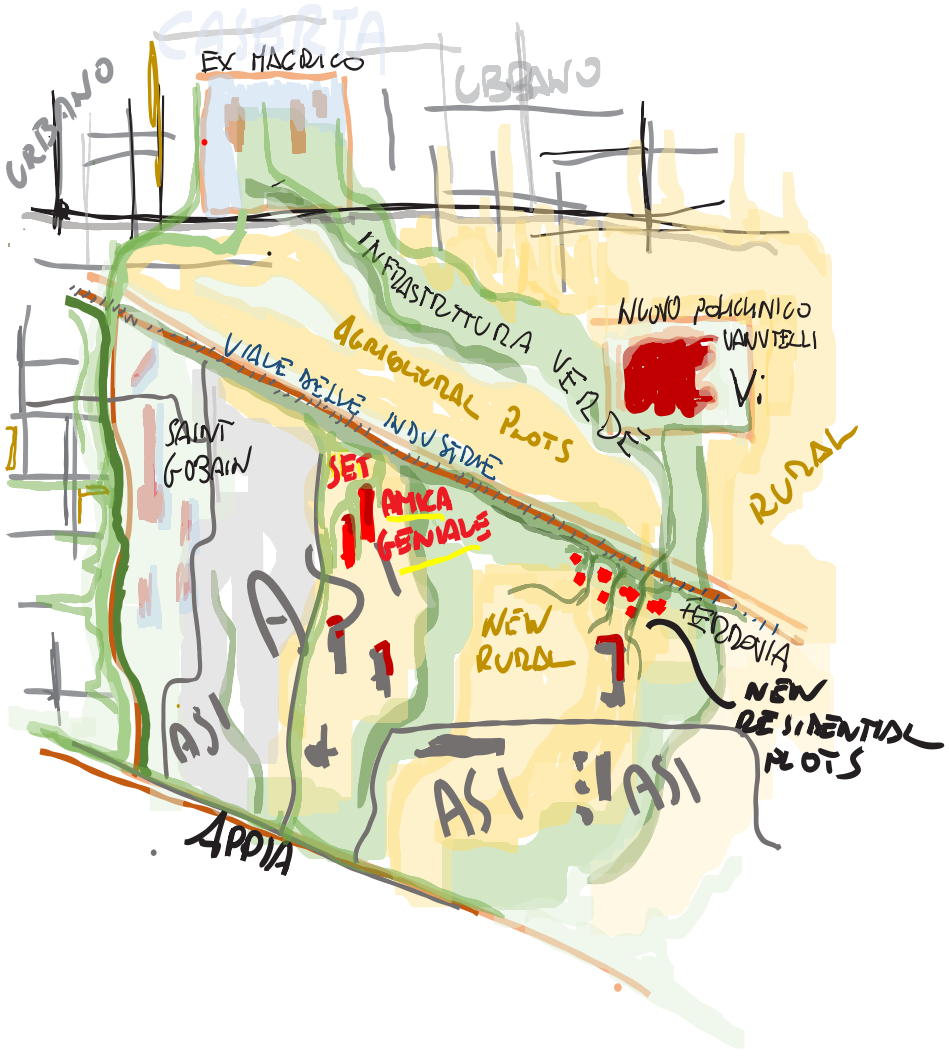
On the previous page: ASI Caserta - Marcianise Agglomerate_sample area planning strategy_Masterplan | *Valentina Vittiglio, 2021*

tion of phytoorimeds within the research Ecoremed, through the planting of about 17,500 poplars. A condition therefore complex. A peri-urban environment in which regeneration, safety and remediation, put in place within a wider spatial project (masterplan), can be the prerequisites for a new urban quality, promote the protection of agricultural sectors and reinterpret them in a broader perspective that goes beyond the concept of agriculture as a practice aimed at the mere production of primary goods, placing it in a broader territorial vision, generating new land and grafting new public space and collective urban equipment into the industrial agglomeration. In this way the latter is no longer an enclave in an area that does not recognize it and with respect to which it has remained indifferent for decades, but part of a complex landscape, "operational" (Brenner), crossed by networks with different degrees of mobility, again usable. The project is organized, in essence, on a green infrastructure axis along which, in a sort of symmetry is not specular but "balanced", a heterogeneous multiplicity of eco-actions of project, generating a "promenade" peri-urban at the ends of which there are the urban fabric of Marcianise and a part of the industrial agglomeration, points of departure and arrival of a regenerated land and, therefore, again usable and habitable, but also spatially unpredictable, unexpected.

ASI Caserta - Marcianise Agglomerate: Former factory Olivetti, 1969 | *Ph Valentina Vittiglio, 2022*

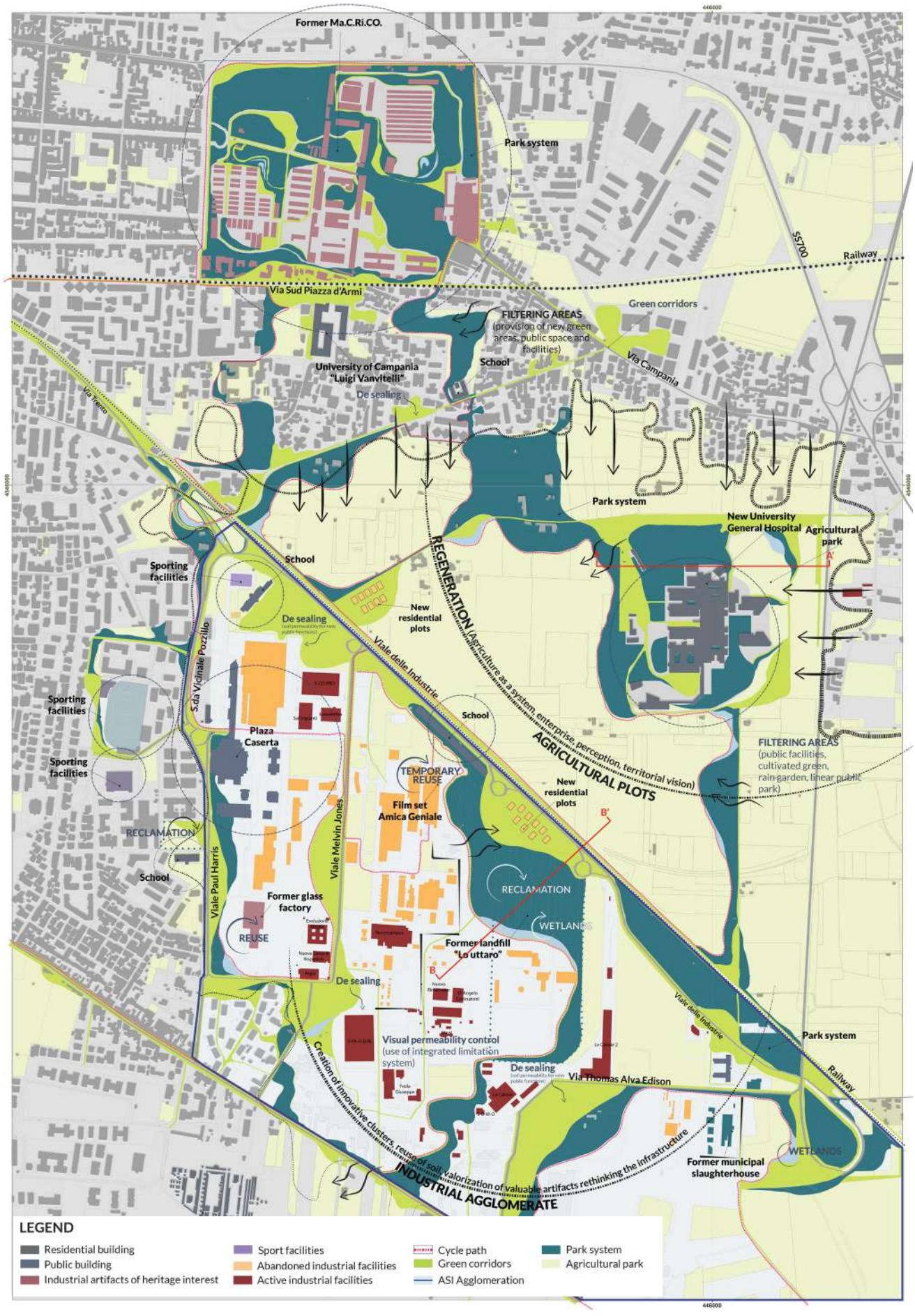
Caserta sample area
A proposal for urban regeneration

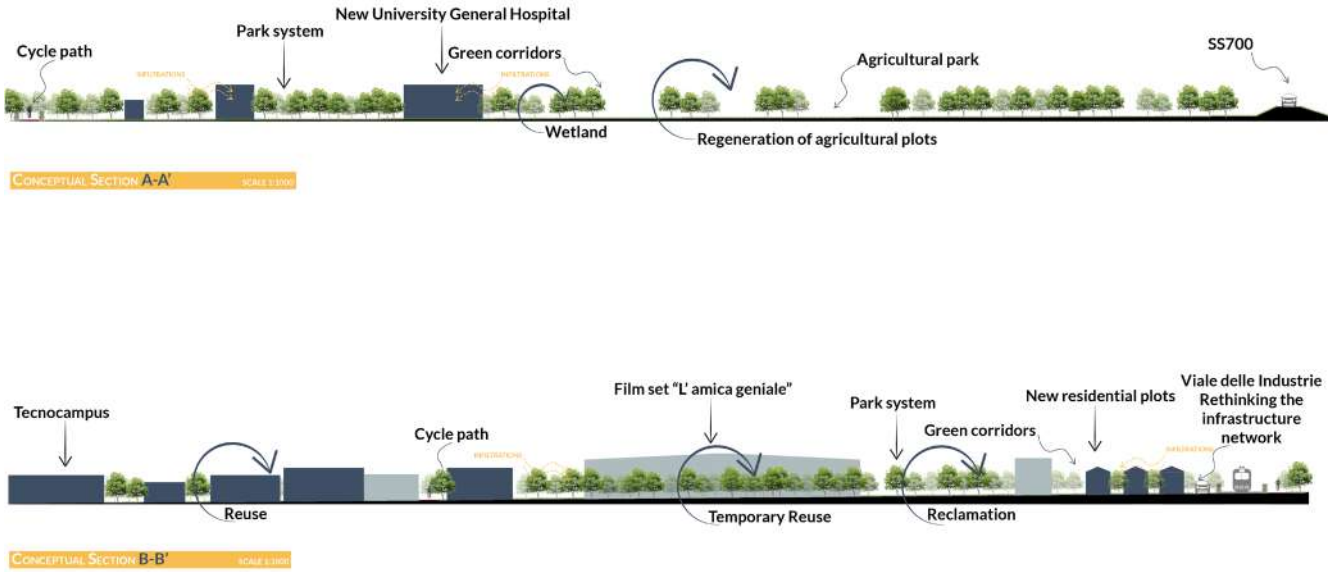
The sample area that refers to the agglomeration called "Caserta", is located south-east of the Royal Palace. A typically periurban area, characterized by physical, functional and landscape degradation, connected to phenomena of waterproofing and contamination of the soil, is also characterized by the presence of abandoned industrial artifacts, landfills, marginal areas and a strong agricultural component bordered by urban fringes and mountain reliefs to the east where there are several quarries. Particularly important within this framework is the presence of the landfill and storage sites of Lo Uttaro, for years central in the regional waste disposal system and currently closed and pending the completion of the reclamation and a re-use project; the former industrial area of Saint Gobain, which is the subject of a partial conversion process, and the former municipal slaughterhouse, which is now decommissioned. The entire area is well connected with the road infrastructure network (urban, suburban, highway) and iron, both perceived as the origin of territorial fractures.
The railway line in fact represents a sharp break between the north-south part of the city while the variant ANAS Capua-Maddaloni, cuts the so-called "gloomy", the historical ways that climb towards the Tifatini mountains. In particular, along the edges, the industrial agglomeration is defined



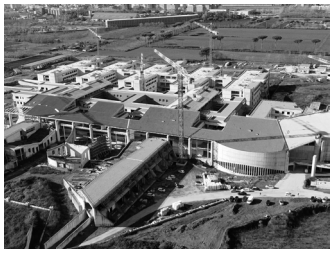
ASI Caserta - Caserta Agglomerate: sample area project_Concept | *Giuseppe Guida, 2021*

On the next page: ASI Caserta - Caserta Agglomerate_sample area planning strategy_Masterplan | *Valentina Vittiglio, 2021*


Former Ma.C.Ri.CO.
Park system
SS700
Railway
Via Sud Piazza d'Armi
FILTERING AREAS
(provision of new green areas, public space and facilities)
Green corridors
University of Campania "Luigi Vanvitelli"
School
Via Campania
De sealing
Via Trento
Park system
New University General Hospital
Agricultural park
REGENERATION (Agriculture as a system, enterprise, perception, territorial vision)
AGRICULTURAL PLOTS
Sporting facilities
School
New residential plots
De sealing
S.da Vicinale Pozzillo
Viale delle Industrie
Sporting facilities
Plaza Caserta
School
FILTERING AREAS
(public facilities, cultivated green, rain-garden, linear public park)
Sporting facilities
TEMPORARY REUSE
New residential plots
Film set Amica Geniale
RECLAMATION
Viale Melvin Jones
School
Viale Paul Harris
Former glass factory
RECLAMATION
WETLANDS
REUSE
Former landfill "Lo uttaro"
De sealing
Visual permeability control
(use of integrated limitation system)
Viale delle Industrie
Park system
Railway
Creation of innovative clusters, reuse of soil, valorization of valuable artifacts rethinking the infrastructure
De sealing
Via Thomas Alva Edison
WETLANDS
Former municipal slaughterhouse
INDUSTRIAL AGGLOMERATE
LEGEND
Residential building
Public building
Industrial artifacts of heritage interest
Sport facilities
Abandoned industrial facilities
Active industrial facilities
Cycle path
Green corridors
ASI Agglomeration
Park system
Agricultural park



On the top page: ASI Caserta - Caserta Agglomerate_ sample area planning strategy_Sections | *Valentina Vittiglio, 2021*



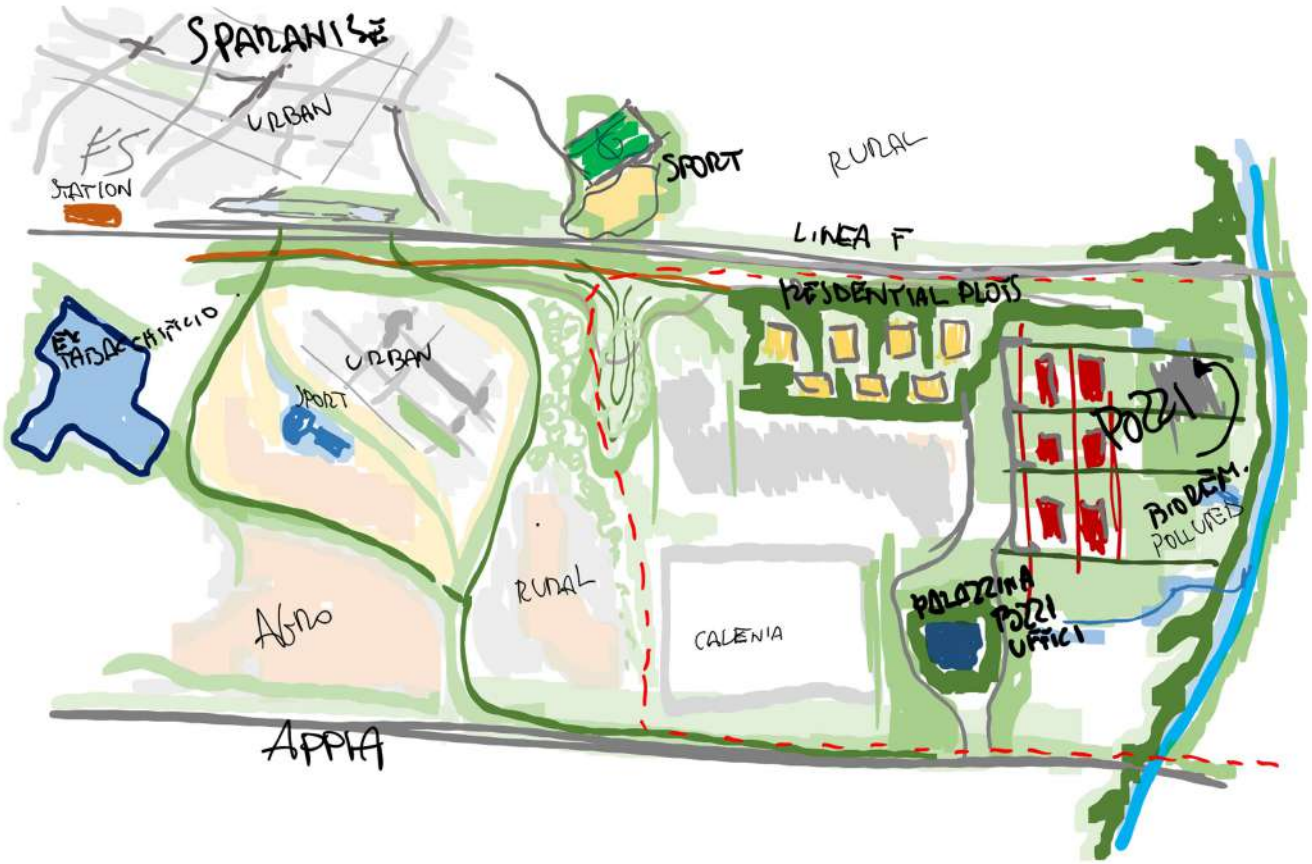
ASI Caserta - Caserta Agglomerate: New Polyclinic under construction | *PURE Research Team, 2021*

ASI Caserta - Caserta Agglomerate: Temporary film set "L'amica geniale" | *PURE Research Team, 2021*

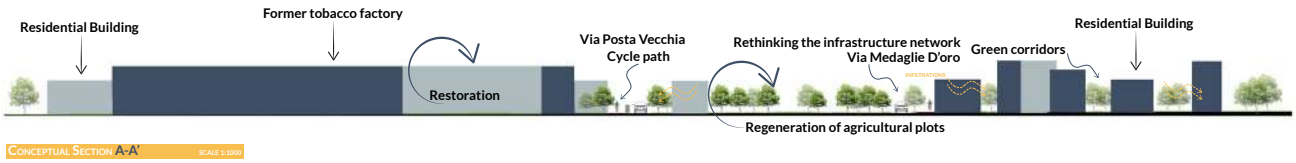
by important arteries that connect it both with the consolidated urban fabric of Caserta and with that of the neighboring municipalities: Viale delle Industrie and Via Appia, which allow, among other things, a direct connection with the Bourbon axis Charles III and the Vanvitellian complex of the Reggia; Viale Abramo Lincoln and the nearby Via Sud Piazza d'Armi connect it to the area of the former Ma.C.Ri. CO. (Magazzino Centrali Ricambi Mezzi Corazzati, is a decommissioned military area with an extension of 324,533 square meters, currently owned by the Diocesano per il Sostentamento del Clero - I.D.S.C.) while via Sossietta Scialla with the New Polyclinic still under construction.
The concept for this sample area tries to fix the critical issues detected, generating new green infrastructure made of public space, new equipment, slow mobility routes, residential wedges, enhancement of agricultural areas and areas for temporary and informal uses.
A system able, in the medium-term, to re-knit and partially merge the industrial agglomeration with the surrounding urban fabric, making it an integral part of a single urban system. A vital land reserve for the city. In particular, along the north-south axis is imagined the creation of a park-system (that is, a complex infrastructure of regeneration and connection) that from the area of the former Ma.C.Ri.CO. runs out the agglomeration keeping together the spaces of disposal and contamination, residual areas close to the infrastructure and providing for the same redevelopment interventions that give it new use and public function. The park system is configured as a filtering area between the urban-agricultural-industrial components in which to bring together a series of actions, including ecological, such as the creation of wetlands for the safety of soils, for the natural development of biodiversity and for the development of recreational activities, and reclamation interventions for the area of Lo Uttaro.
Together with the creation of filter areas, the design strategy provides for a rethinking of the main axes of connection, reinterprets them as green infrastructure, equipped and cycling that, grafting into the urban fabric and industrial plate, generate new public space reserves.
The large equipment of the new Polyclinic, now isolated cluster in a predominantly agricultural area, becomes an integral part of the new system-park, within which limited areas are provided for new residences connected with hospital functions and open spaces and green.
Inside the agglomeration the "percola" park system between some artifacts to be regenerated and industrial structures still active and compatible with the new typically urban functions that are grafted.

North Volturno sample area
A proposal for urban regeneration

The industrial agglomeration called North Volturno, in particular the western part, has assumed the present shape following the installation of the factory of Ceramics Wells. For this reason, the architects Figini and Pollini defined, within the town plan prepared by Teknè, the deposits used for the entire parcelling, up to the Rio dei Lanzi, after which the shape of the agglomeration bends south in the territory of Pignataro Maggiore. The decommissioning of the Pozzi area, only partially now converted to high production, has left on the ground abandoned buildings (in particular those of greater value with the coverage to V Shed), large areas of relevance in abandonment, Never settled plots, green areas of different types (woodland, shrub, untouched nature naturans), artifacts such as (in addition to those already mentioned in the Pozzi production) the office building of the same Pozzi, always by Figini and Pollini, but also a critical area classified as "polluted" by ARPAC, in what was the area of relevance of the Pozzi. This part of the agglomeration fuctionally refers to the city of Sparanise and falls almost entirely within its administrative boundaries. With it, the agglomeration is connected by the Via Appia, by large agricultural buffer areas and by the axiality generated by the Naples-Cassino-Rome railway line, as well as several secondary roads and cross-country tracks.
The concept also starts from the strategies of the municipal urban plan of Sparanise (developed with the scientific advice of DADI-Vanvitelli) and from the precise analysis of the land use, equipment, infrastructure and drosscapes contained in the plan.
The concept for this sample area uses the territorial elements described to generate a change in the relationship between city and industrial area through two directionality. The first, to the north, follows the railway route: starting from a hypothesis of reclamation of the polluted area of the Pozzi to the east, it is assumed



ASI Caserta - North Volturno Agglomerate: sample area project_ Concept | *Giuseppe Guida, 2021.*



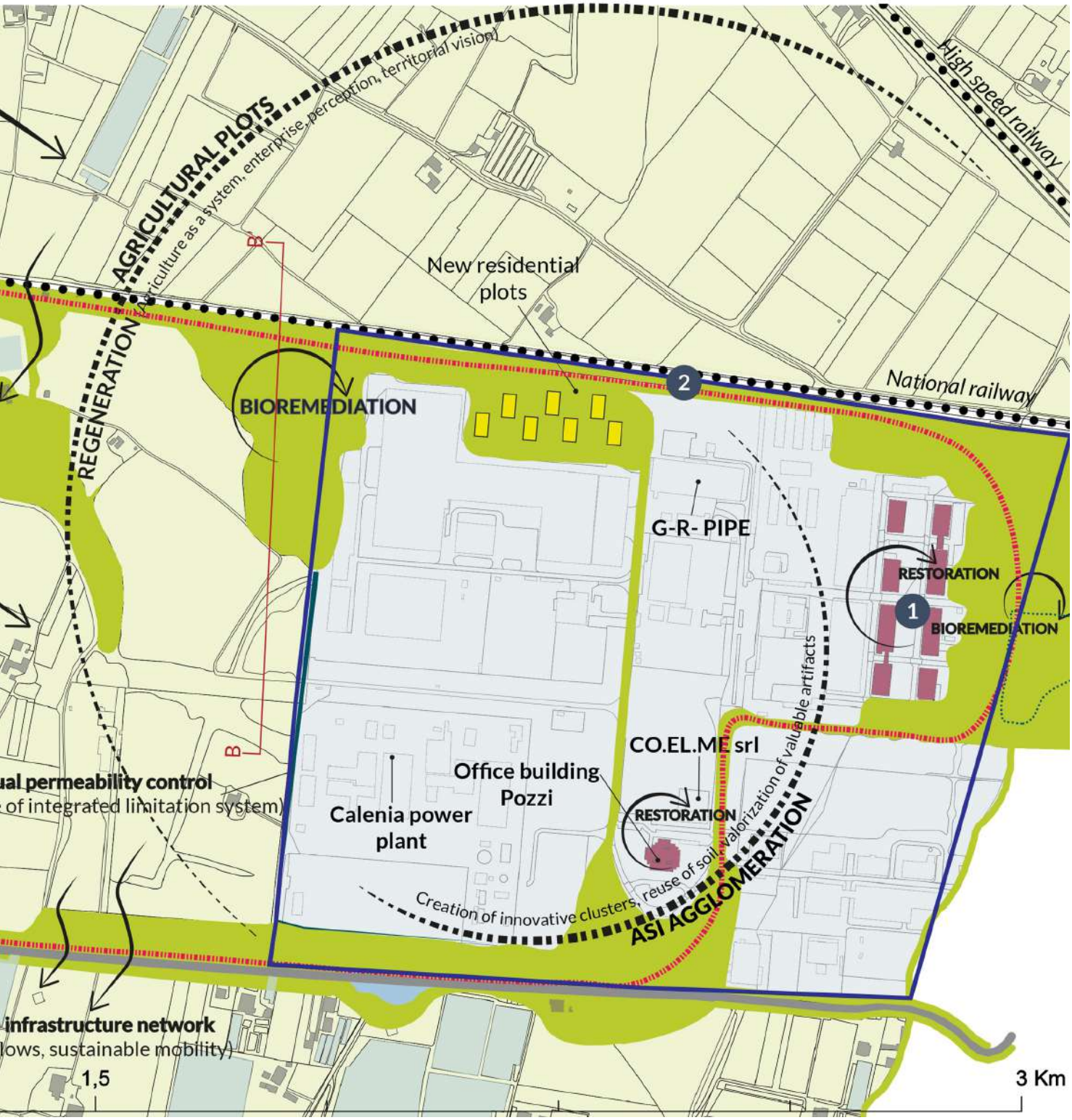
a restoration of the industrial artifacts Pozzi and then also provide a residential area inside the agglomeration. This is, in the latter case, the recovery of an area now abandoned that could become an offshoot of the city in the agglomeration and head element of a regeneration path that runs along the railway intercepting different areas and equipment, and then finish in the building of the former tobacco factory, for which it is imagined a recovery to compatible uses (cultural, commercial, civic, loisir). The second connecting axis starts from the office building of Pozzi, for which are provided (view of the municipal property) reuse for civic and cultural uses, and then generate an equipped axis, cycling, as well as pedestrian, along the Appian Way and that, through some areas still mainly agricultural, also comes in the area of the former tobacco factory and station FS, putting in relation to the previous axis.
It is, in summary, to generate two real green infrastructures, where the recovery of some lands in neglect or polluted and some artifacts for public functions, is integrated by a residential plaque that also tries to rethink new identities and functions "urban", an unusual mix within an agglomeration that is now largely inactive and abandoned, but still with many potential from a landscape-environmental point of view. The linear green infrastructure will constitute a new reserve of public space and equipment accessible from the entire territorial area, consisting of the municipalities of Sparanise, Calvi Risorta, Pignataro Maggiore.

On the top page: ASI Caserta - North Volturno Agglomerate_ sample area planning strategy _Sections | *Valentina Vittiglio, 2021*

ASI Caserta - North Volturno Agglomerate_ Industrial Complex Ceramica Pozzi | *Ph Mariano De Angelisi and Francesco Cimmino, 2017*

LEGEND

- ASI Agglomeration
- Residential building
- Public building
- Industrial artifacts of heritage interest
- Greenhouses
- ASI Agglomeration
- Agricultural fields
- Sport facilities
- Cycle path

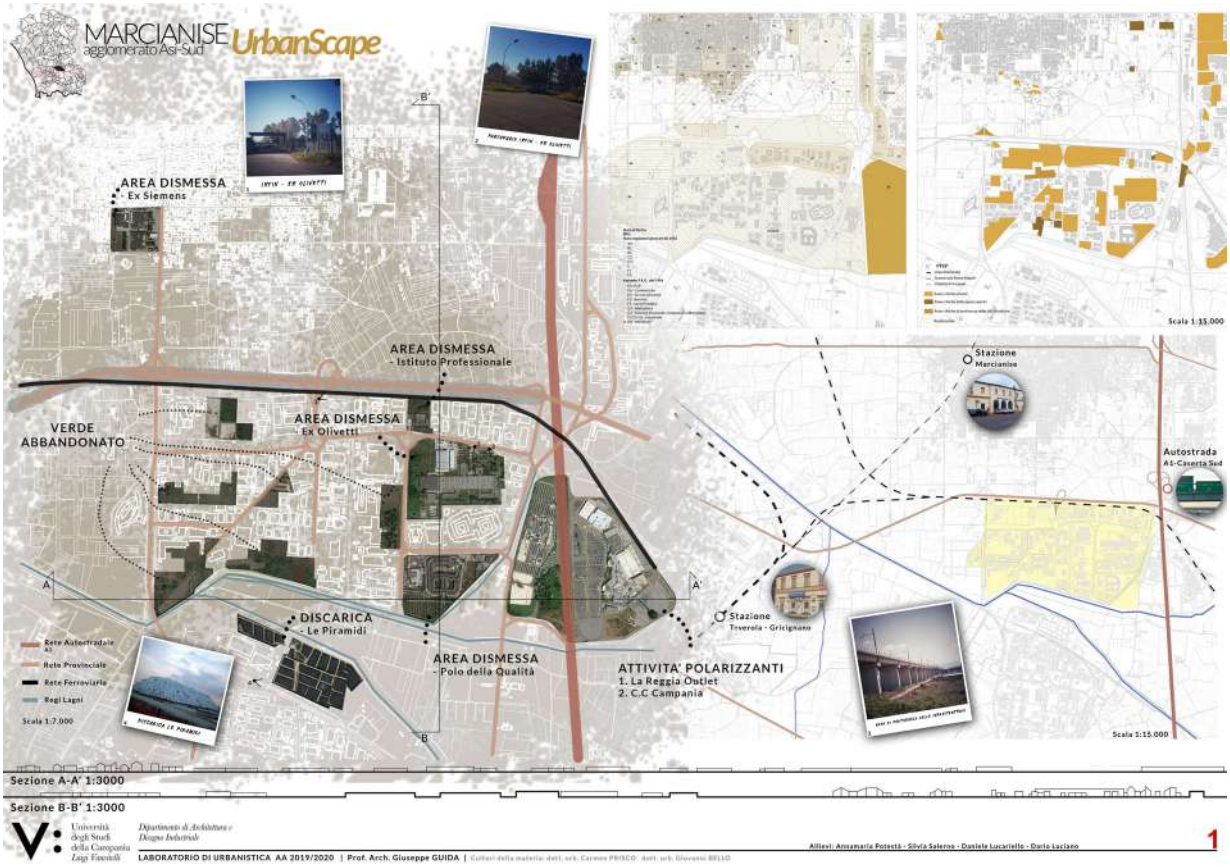


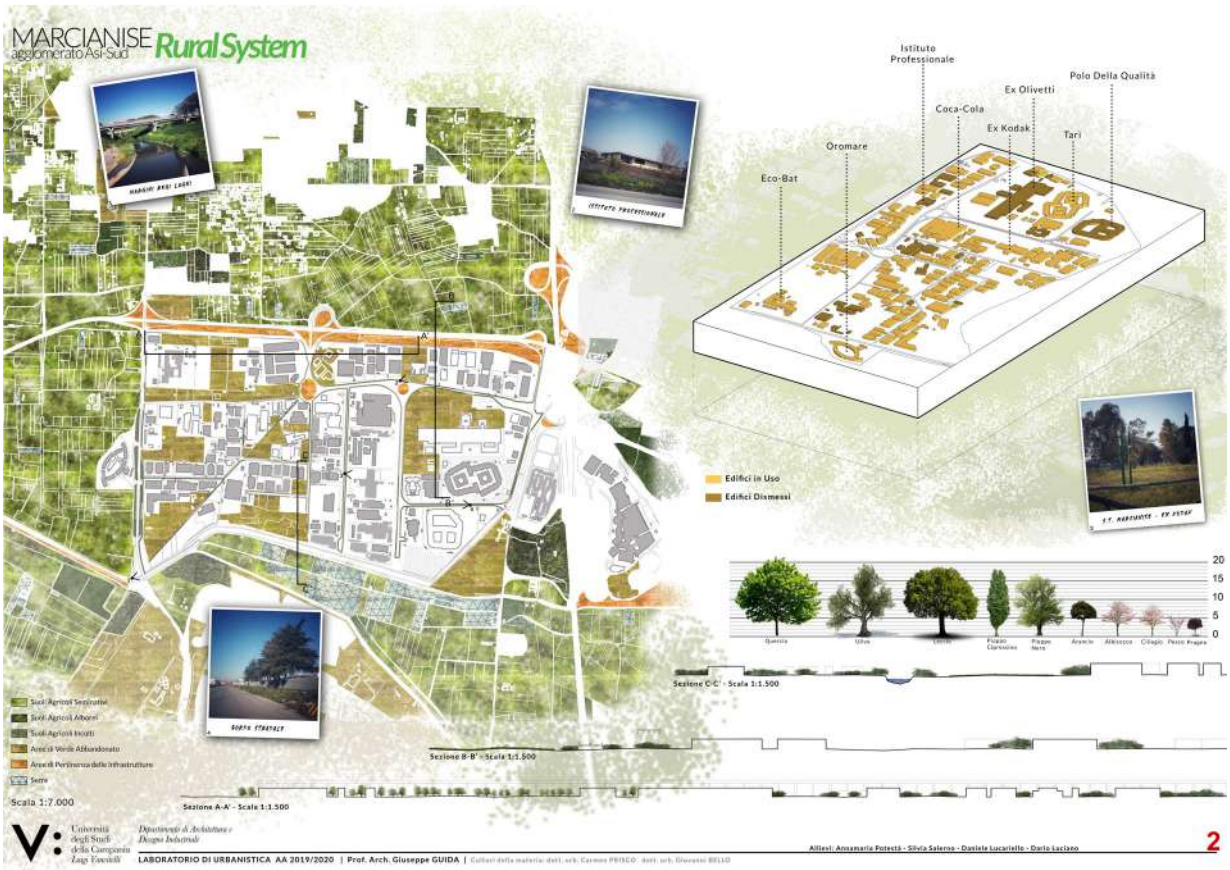
ASI Caserta - North Volturno Agglomerate_sample area planning strategy_Masterplan | *Valentina Vittiglio, 2021.*

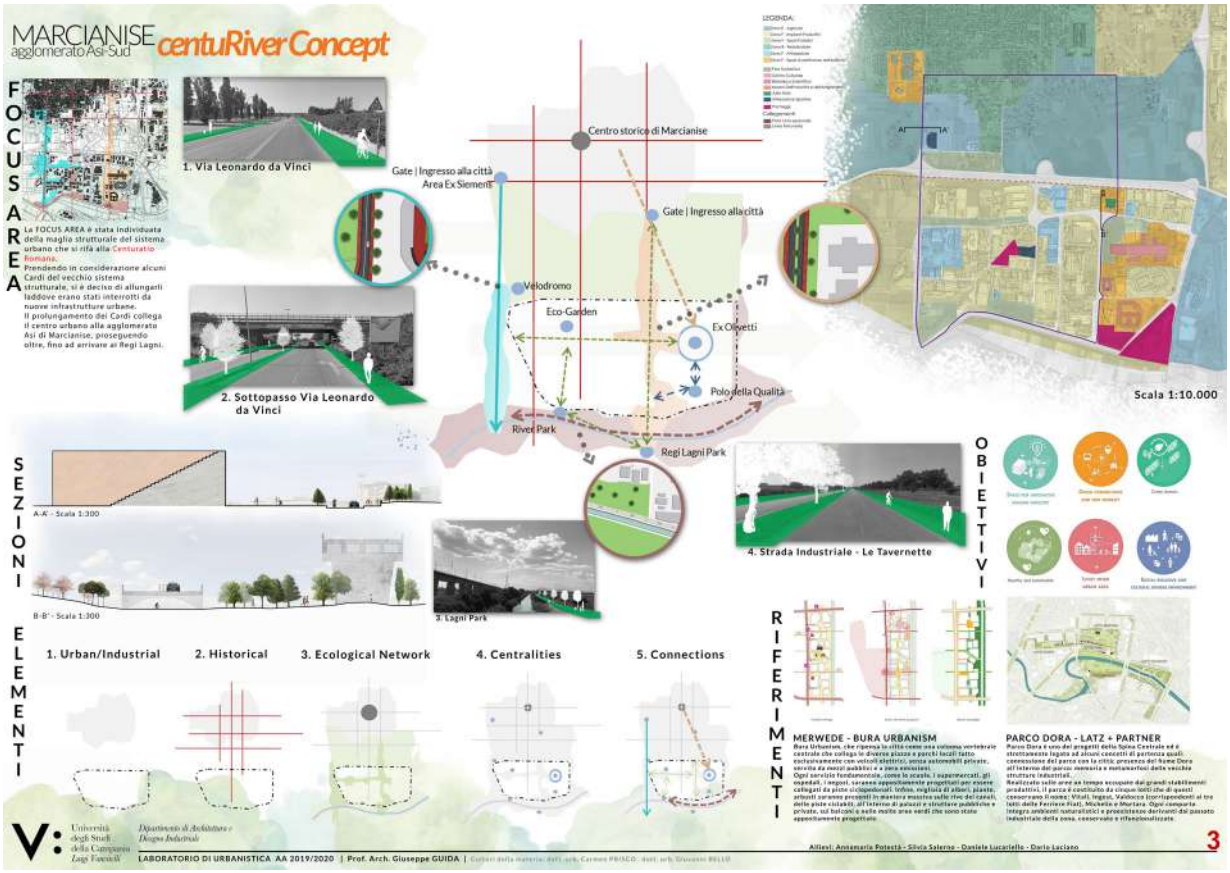
Students workshop and Internship | Urban Planning experimentations

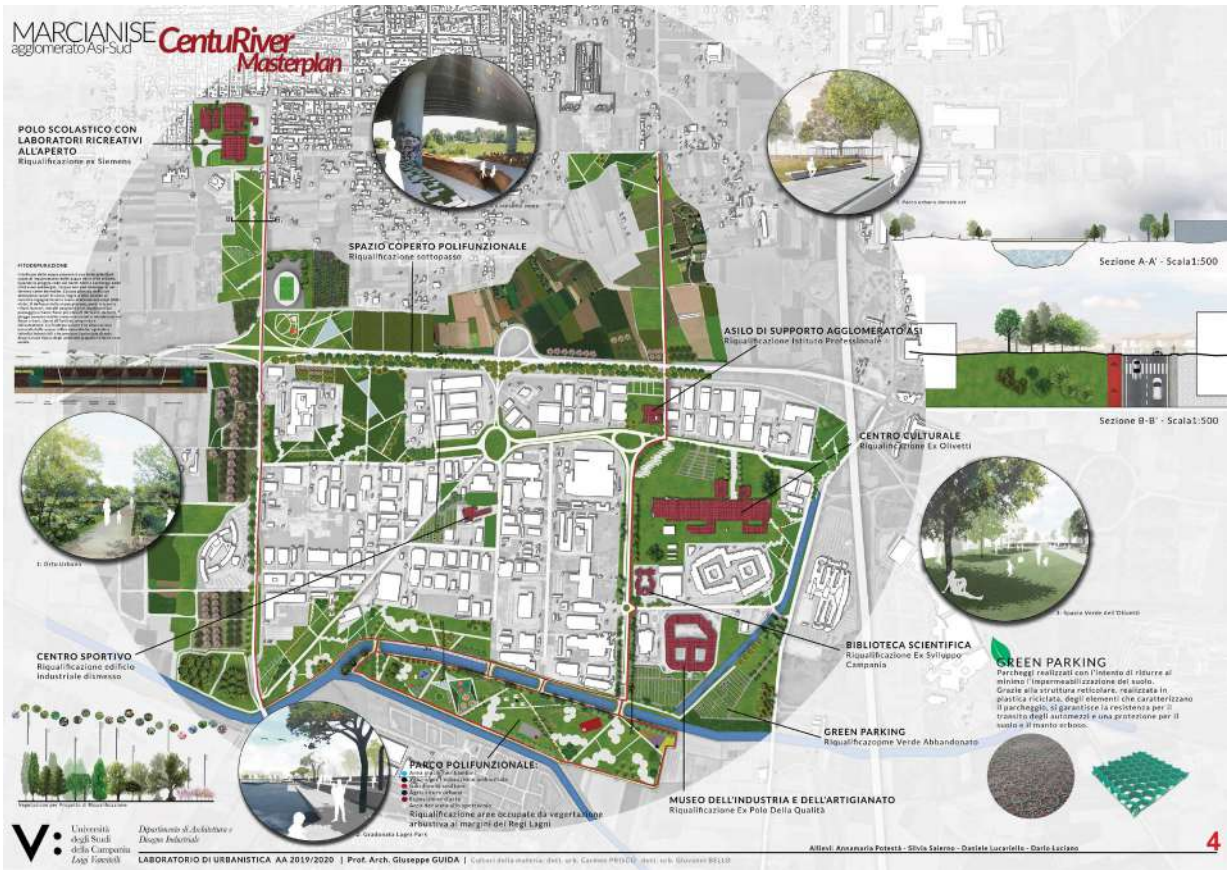
University of Campania "Luigi Vanvitelli"
Department of Architecture and Industrial Design

Laboratory of Urban Planning a.a. 2019/2020 - Marcianise Agglomerate | *Prof. Arch. Giuseppe Guida with dott. urb. Carmen Prisco and PhD. Giovanni Bello - students: Annamaria Potestà, Silvia Salerno and Dario Luciano*

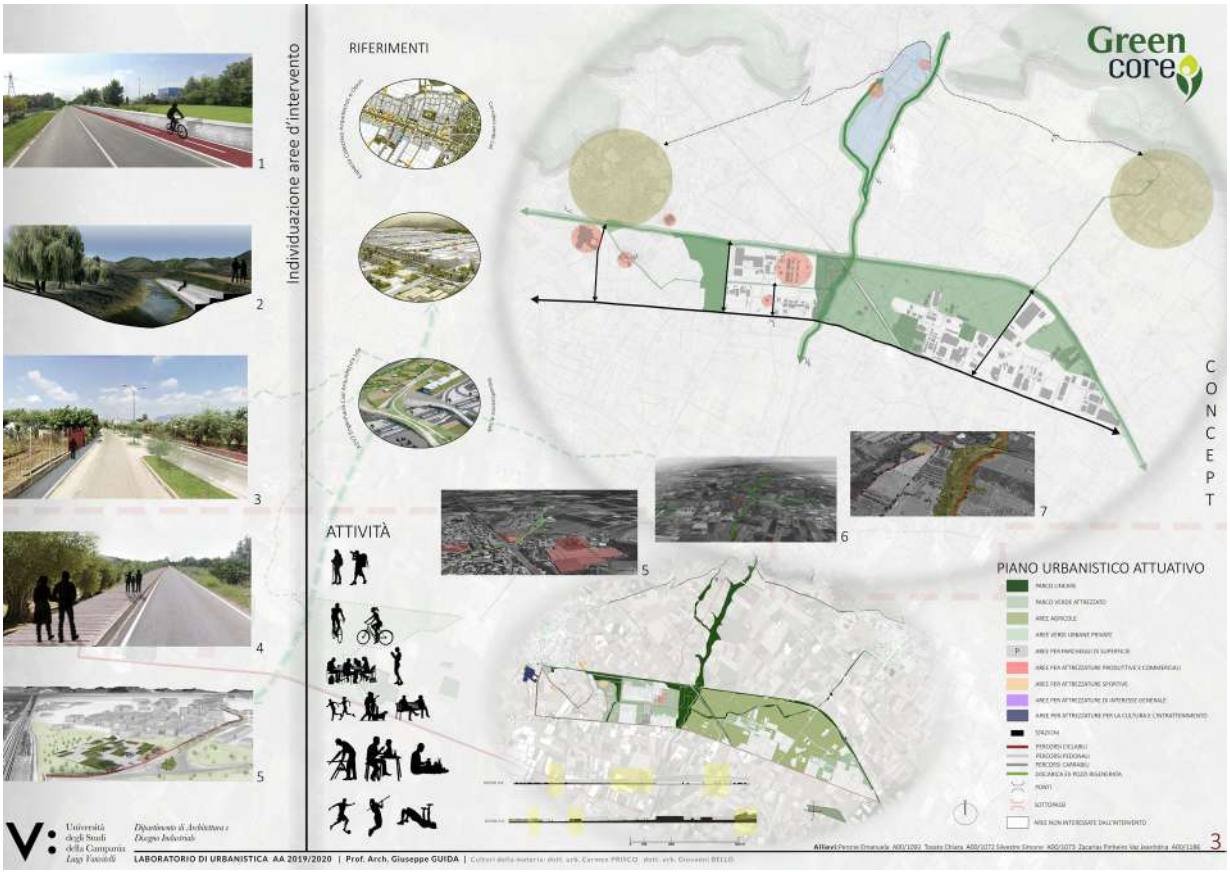


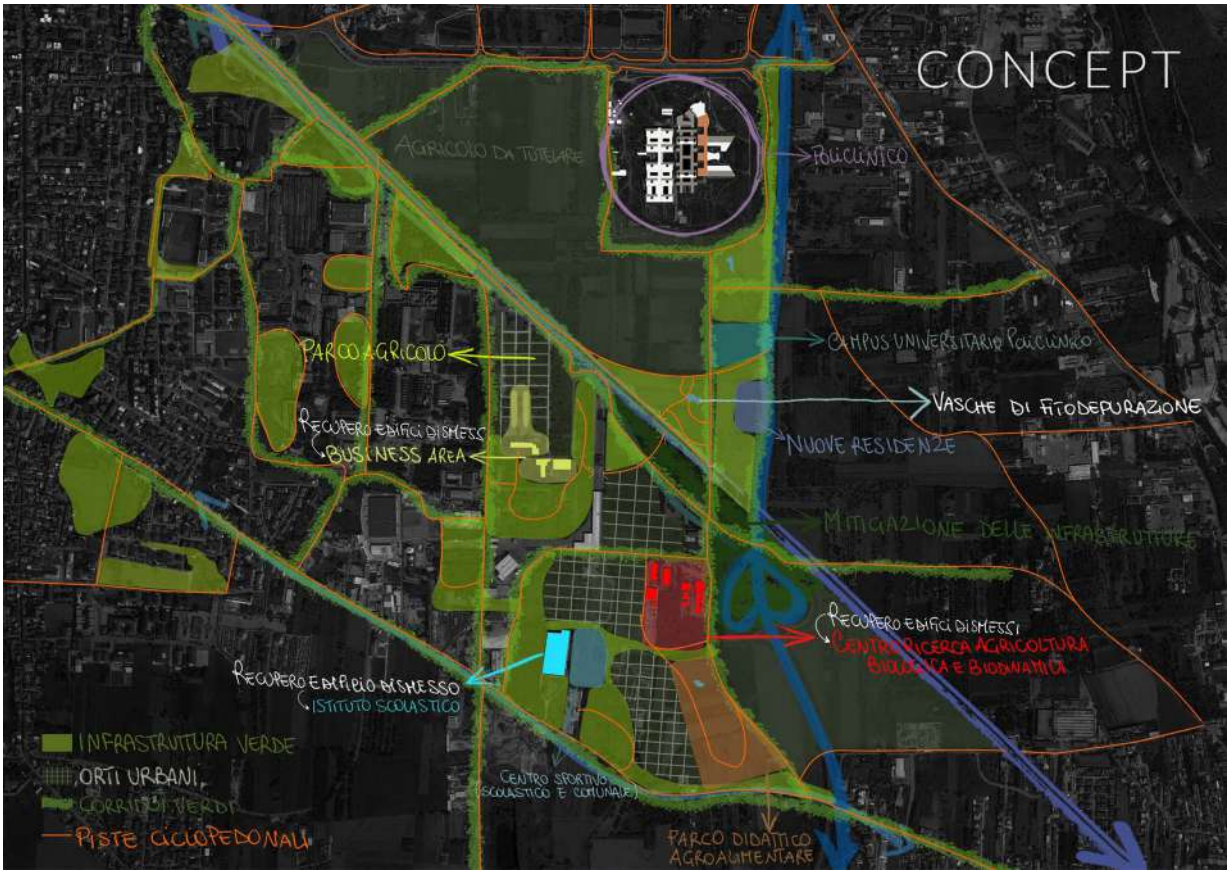


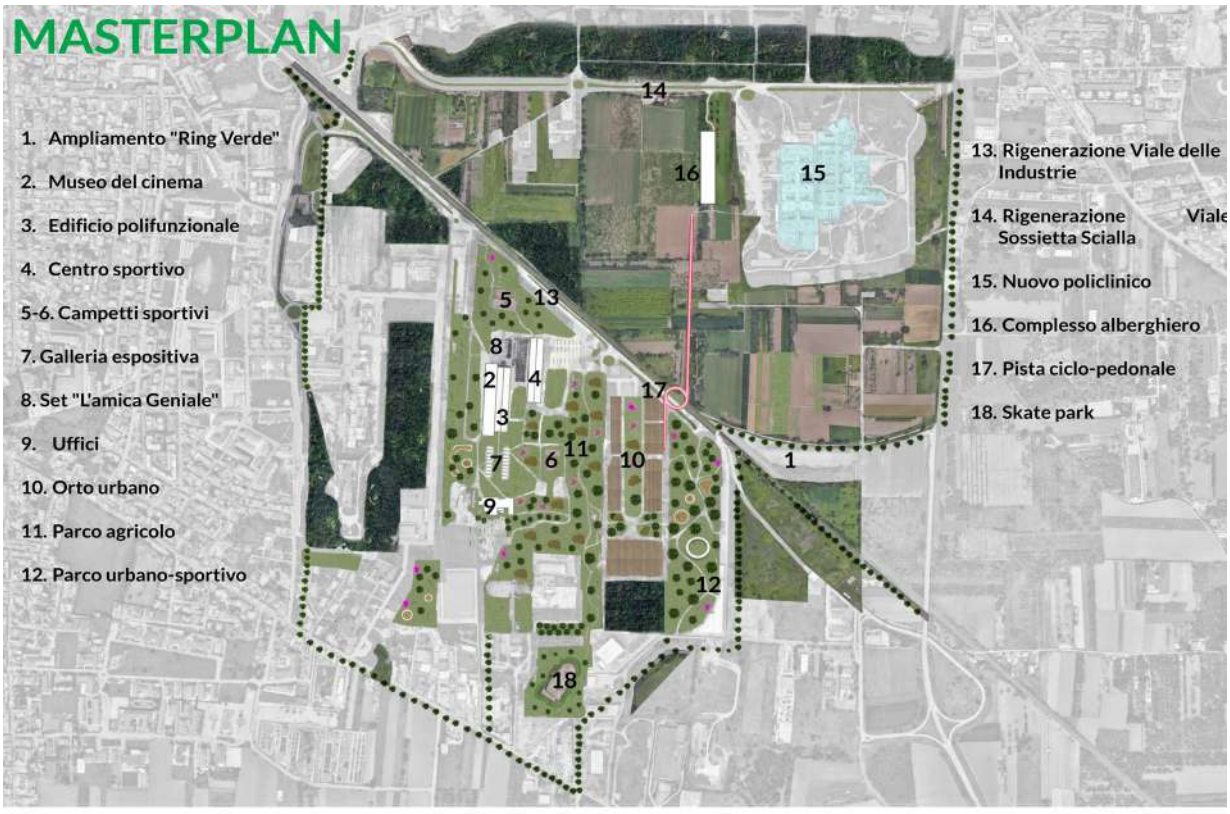

MARCIANISE agglomerato Asi-Sud centuRiver Concept
FOCUS AREA
La FOCUS AREA è stata individuata della maglia strutturale del sistema urbano che si rifà alla Centuriatio Romana.
Prendendo in considerazione alcuni Cardi del vecchio sistema strutturale, si è deciso di allungarli laddove erano stati interrotti da nuove infrastrutture urbane.
Il prolungamento dei Cardi collega il centro urbano alla agglomerato Asi di Marcianise, proseguendo oltre, fino ad arrivare ai Regi Lagni.
1. Via Leonardo da Vinci
2. Sottopasso Via Leonardo da Vinci
Centro storico di Marcianise
Gate | Ingresso alla città Area Ex Siemens
Gate | Ingresso alla città
Velodromo
Eco-Garden
Ex Olivetti
Polo della Qualità
River Park
Regi Lagni Park
Scala 1:10.000
SEZIONI
A-A' - Scala 1:300
B-B' - Scala 1:300
3. Lagni Park
4. Strada Industriale - Le Tavernette
OBIETTIVI
ELEMENTI
1. Urban/Industrial
2. Historical
3. Ecological Network
4. Centralities
5. Connections
RIFERIMENTI
MERWEDE - BURA URBANISM
PARCO DORA - LATZ + PARTNER
Università degli Studi della Campania Luigi Vanvitelli
Dipartimento di Architettura e Disegno Industriale
LABORATORIO DI URBANISTICA AA 2019/2020 | Prof. Arch. Giuseppe GUIDA
Allievi: Annamaria Potestà - Silvia Salerno - Daniele Lucarielle - Dario Luciano
3


MARCIANISE agglomerato Asi-Sud CentuRiver Masterplan
POLO SCOLASTICO CON LABORATORI RICREATIVI ALL'APERTO
Riqualificazione ex Siemens
SPAZIO COPERTO POLIFUNZIONALE
Riqualificazione sottopasso
ASILO DI SUPPORTO AGGLOMERATO ASI
Riqualificazione Istituto Professionale
CENTRO CULTURALE
Riqualificazione Ex Olivetti
CENTRO SPORTIVO
Riqualificazione edificio industriale dismesso
BIBLIOTECA SCIENTIFICA
Riqualificazione Ex Sviluppo Campania
GREEN PARKING
Riqualificazione Verde Abbandonato
PARCO POLIFUNZIONALE
Riqualificazione aree occupate da vegetazione arbustiva ai margini dei Regi Lagni
MUSEO DELL'INDUSTRIA E DELL'ARTIGIANATO
Riqualificazione Ex Polo Della Qualità
GREEN PARKING
Sezione A-A' - Scala1:500
Sezione B-B' - Scala1:500
Università degli Studi della Campania Luigi Vanvitelli
Dipartimento di Architettura e Disegno Industriale
LABORATORIO DI URBANISTICA AA 2019/2020 | Prof. Arch. Giuseppe GUIDA
Allievi: Annamaria Potestà - Silvia Salerno - Daniele Lucarielle - Dario Luciano
4

Laboratory of Urban Planning a.a. 2019/2020 - North Volturno Agglomerate | *Prof. Arch. Giuseppe Guida with dott. urb. Carmen Prisco and PhD. Giovanni Bello - students: Perone Emanuela, Tosato Chiara, Silvestre Simone and Zacarias Pinheiro Vaz Jeanhdria*

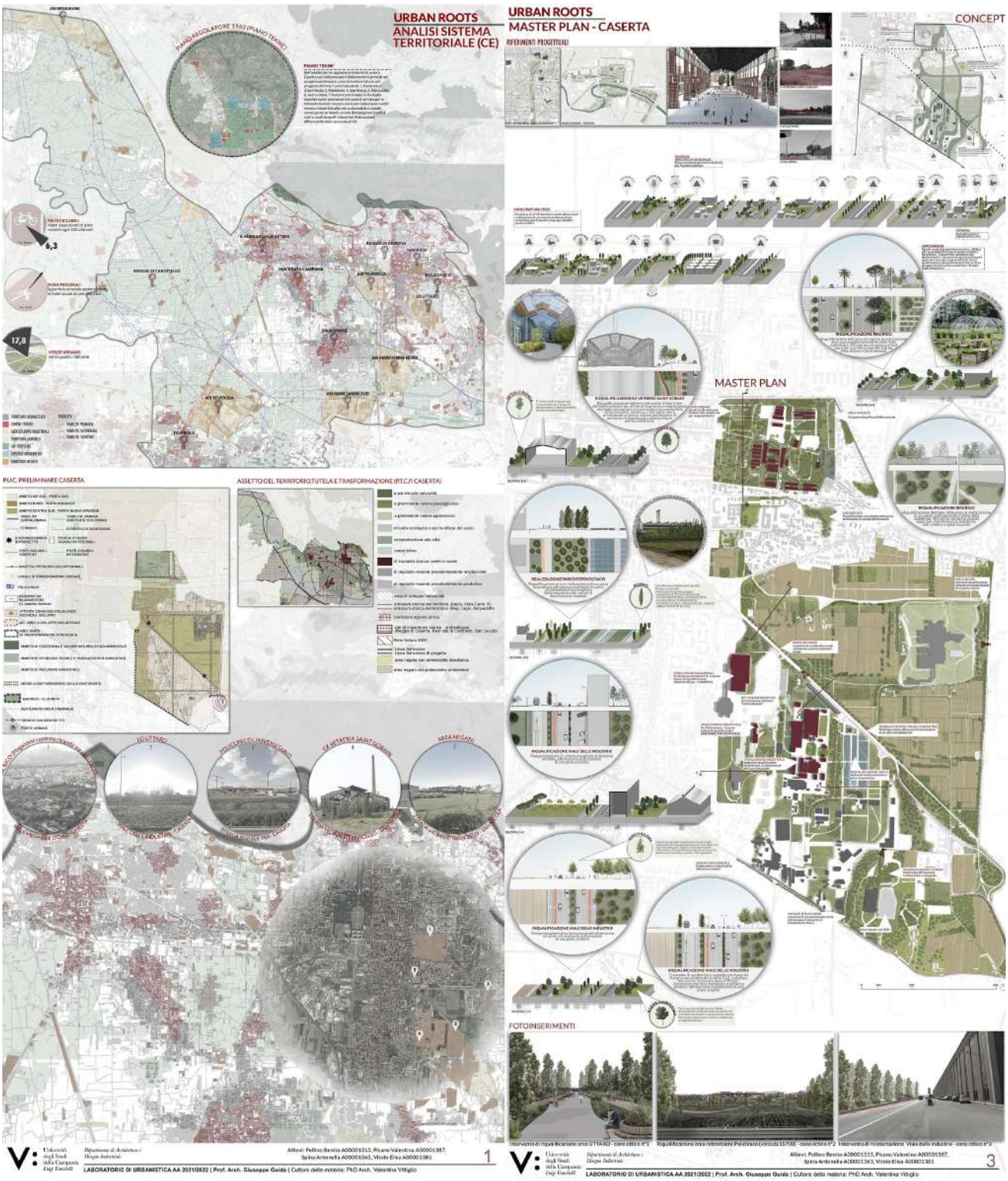




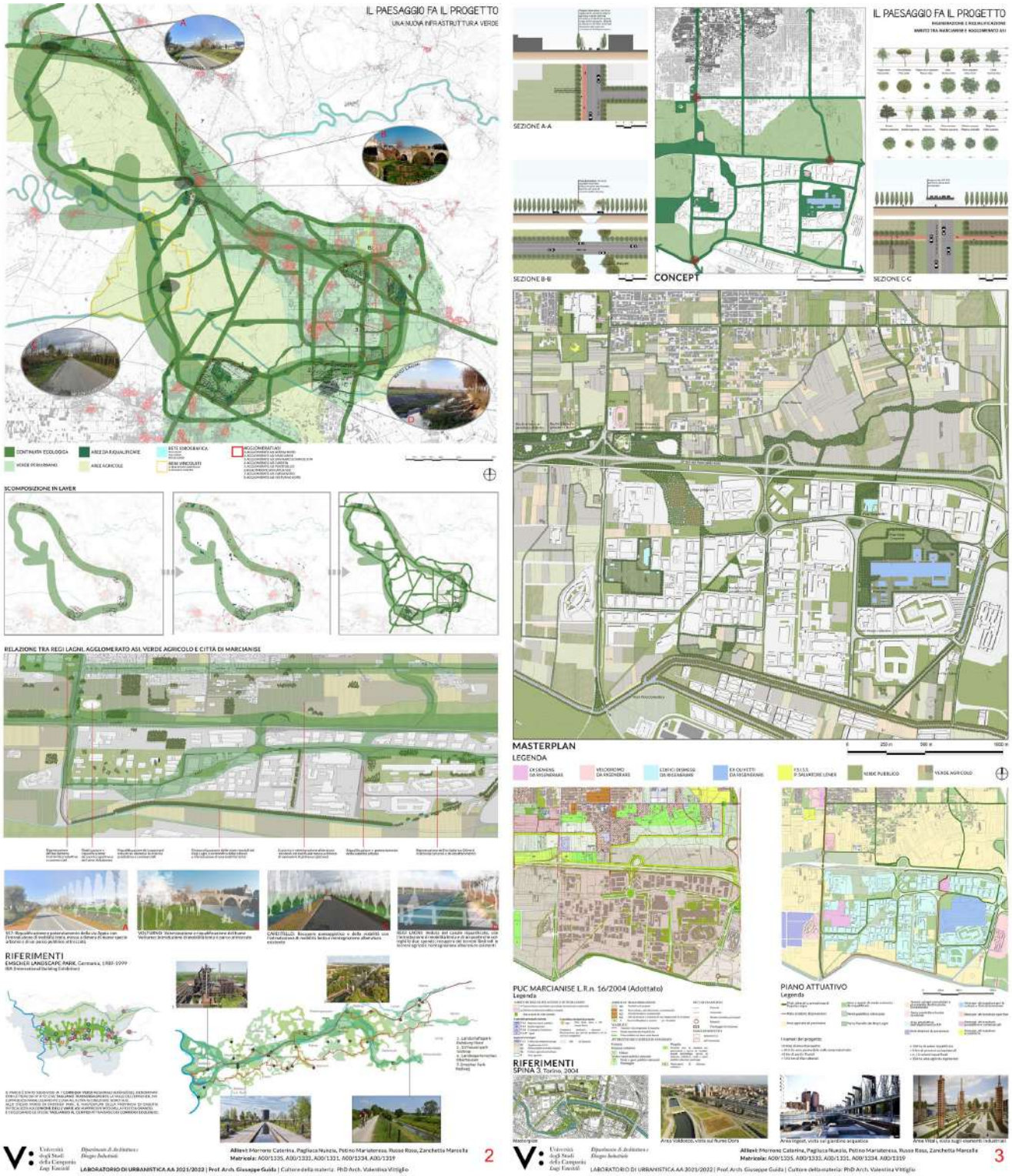


V: LABORATORIO DI URBANISTICA/21 **Prof. Giuseppe Guida** Cultori della materia: Dott. Arch. Valentina Vittiglio e Dott. Urb. Carmen Prisco

Laboratory of Urban Planning a.a. 2021/2022 - Caserta Agglomerate | *Prof. Arch. Giuseppe Guida with PhD. Arch. Valentina Vittiglio*
students: Pellino Benito, Pisano Valentina, Spina Antonella and Vitolo Elisa

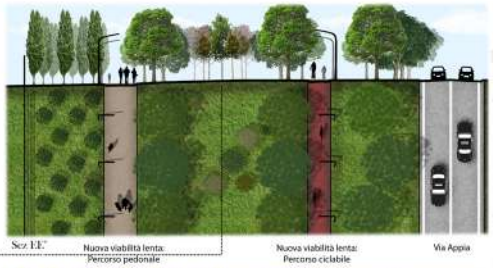


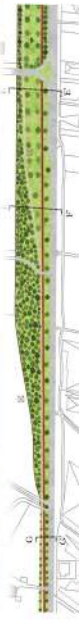
Laboratory of Urban Planning a.a. 2021/2022 - Marcianise Agglomerate | *Prof. Arch. Giuseppe Guida with PhD. Arch. Valentina Vittiglio*
students: Morrone Caterina, Pagliuca Nunzia, Petino Mariateresa, Russo Rosa and Zanchetta Marcella



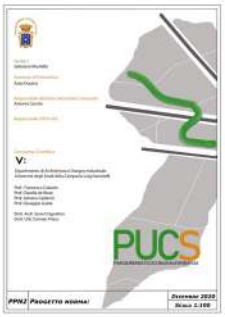

Vista assonometrica sottopassaggio: Via posta Vecchia

Vista assonometrica orto urbano: Viale Medaglia D'oro

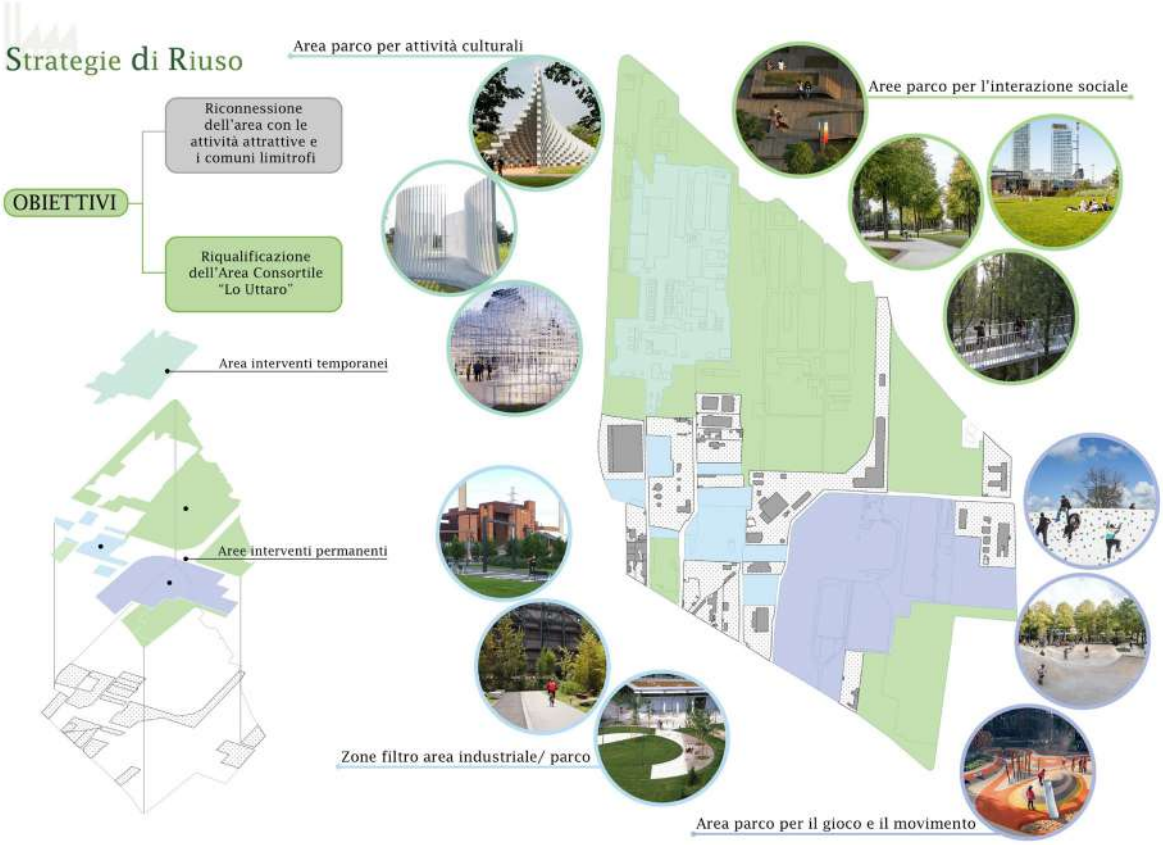


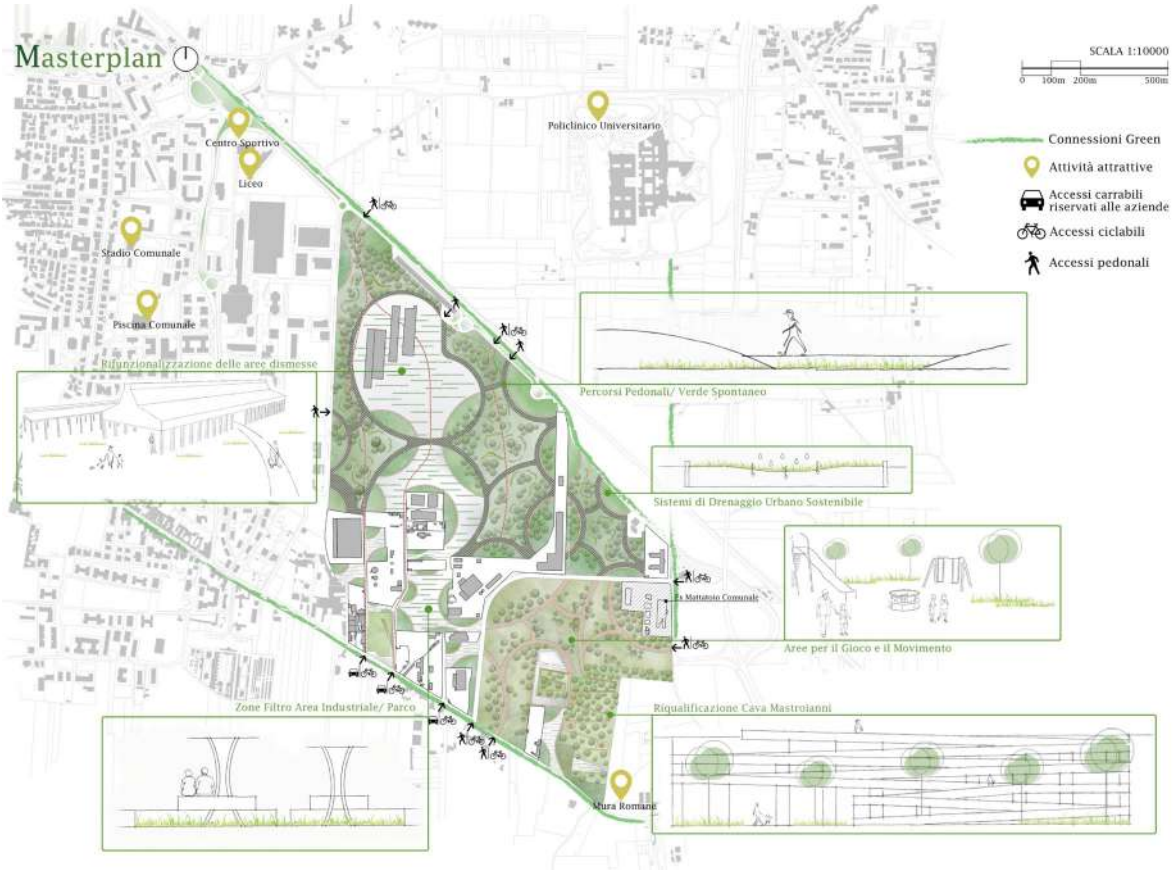



Vista assonometrica orto urbano : Via Medaglia D'oro



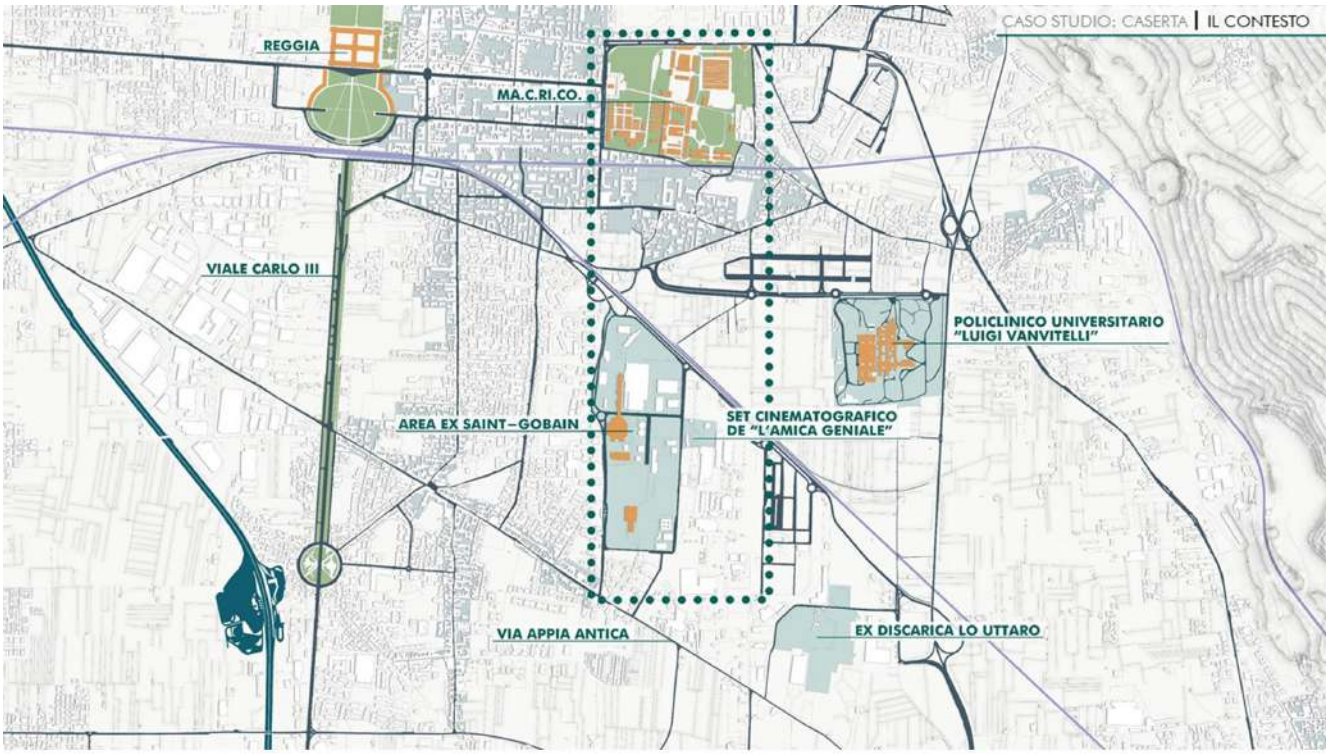

Vista assonometrica cava riqualificata

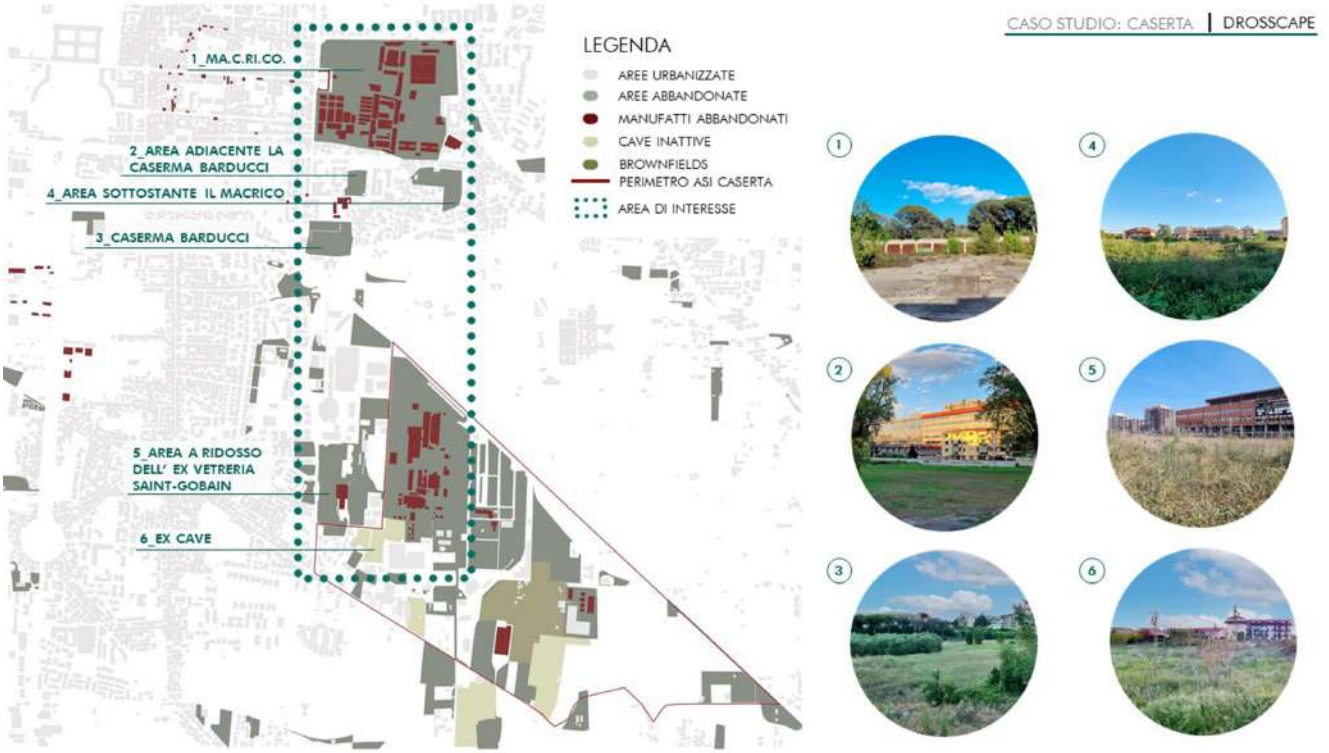

Strategie di Riuso
OBIETTIVI
Riconnessione dell'area con le attività attrattive e i comuni limitrofi
Riqualificazione dell'Area Consortile "Lo Uttaro"
Area interventi temporanei
Aree interventi permanenti
Area parco per attività culturali
Aree parco per l'interazione sociale
Zone filtro area industriale/ parco
Area parco per il gioco e il movimento

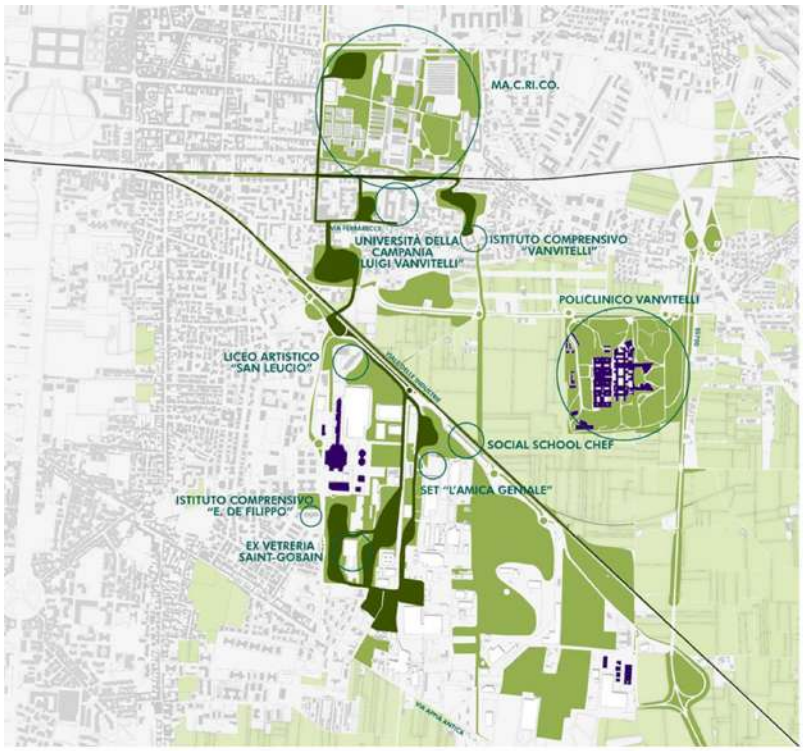

Masterplan
SCALA 1:10000
0 100m 200m 500m
Connessioni Green
Attività attrattive
Accessi carrabili riservati alle aziende
Accessi ciclabili
Accessi pedonali
Centro Sportivo
Liceo
Stadio Comunale
Piscina Comunale
Policlinico Universitario
Rifunzionalizzazione delle aree dismesse
Percorsi Pedonali/ Verde Spontaneo
Sistemi di Drenaggio Urbano Sostenibile
Ex Mattatoio Comunale
Aree per il Gioco e il Movimento
Zone Filtro Area Industriale/ Parco
Riqualificazione Cava Mastroianni
Mura Romane

Degree thesis in Urban Planning a.a. 2021/2022 - Caserta Agglomerate | *Supervisor: Prof. Arch. Giuseppe Guida Assistant Supervisor: PhD. Arch. Valentina Vittiglio - Candidate: Emanuela Perone*

Caserta (con)temporanea. Tattiche di rigenerazione di un ambito urbano





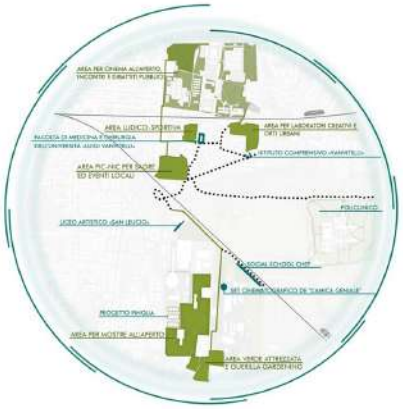


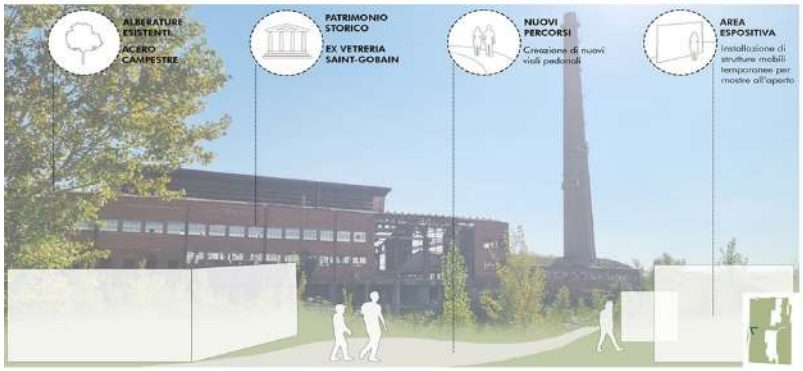
SISTEMA DELLE AREE A VERDE E DELLO SPAZIO APERTO

CONNESSIONI VERDI DI PROGETTO

NUOVI SPAZI PUBBLICI

ATTREZZATURE PUBBLICHE





IL PROGETTO | TATTICHE DI ATTUAZIONE

1 — BANDO DI ASSEGNAZIONE AREE

2 — VALUTAZIONE IDEE

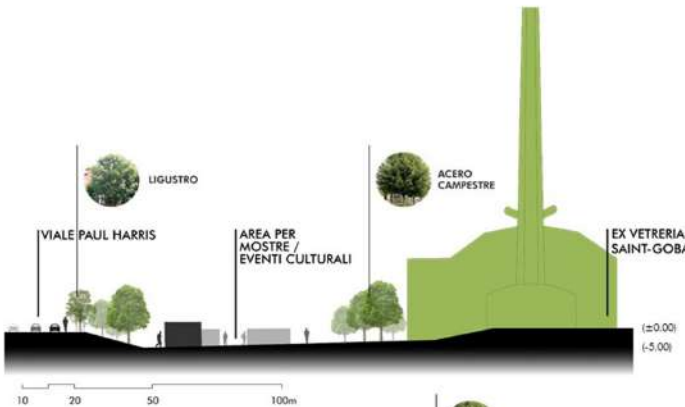
3 — ASSEGNAZIONE E SISTEMAZIONE AREE

4 — ATTREZZATURA AREE

5 — ORGANIZZAZIONE ATTIVITÀ

PROFILI

PROFILO NORD



PROFILO EST