TERRITORIES IN TRANSITION

Across Positionalities

Roma, 2-3 febbraio 2023 | February 2nd-3rd 2023

A cura di | Edited by
Federico Broggini, Amina Chouaïri, Pietro Manaresi, Joan Martí Elias, Ana Scutari, and Cédric Wehrle

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Il volume raccoglie i contributi presentati al seminario internazionale di dottorato “Across Positionalities”, organizzato dal gruppo FNRS “Territories in Transition” e ospitato il 2–3 febbraio 2023 presso il Dottorato in Architettura Città Paesaggio dell’Università Roma Tre. Il seminario ha riunito dottorandi e post-doc delle università partner attorno al tema della transizione nei territori contemporanei. Attraverso la condivisione di ricerche, metodi e riferimenti, l’incontro ha attivato un dialogo a più voci, volto a esplicitare posizionamenti critici e favorire apprendimento e disapprendimento collettivo.

This volume gathers contributions presented at the international PhD seminar “Across Positionalities,” organised by the FNRS group “Territories in Transition” and hosted on 2–3 February 2023 by the Architecture City Landscape Doctorate at Roma Tre University. The seminar brought together PhD candidates and post-doctoral researchers from partner institutions to reflect on transition in contemporary territories. Through the exchange of research progress, methods, and references, the meeting fostered a multi-voiced dialogue aimed at articulating critical positionalities and encouraging collective learning and unlearning.

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MAKING ROOM FOR EMERGING ALTERNATIVES

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Are we transitioning?

Disappointed or hopeful, but still apprehensive. COP28 has just concluded with a declaration in favour of a transition from "fossil fuels in energy systems, in a fair, orderly and equitable way, accelerating action in this critical decade, so as to reach net zero by 2050" (COP 2023, p. 5). If we look at the news of the conference, we remain trapped in emotions, as we have already been during the pandemic. Placing ourselves at the right distance from the sequence of events, we can develop different reasoning and put the question of transitions in a historical perspective, as done by the curators of the Rotterdam Architecture Biennale.

The Report of MIT, commissioned in 1972 by the Club of Rome, is generally recognized as the first awareness of the planetary effects produced by human activities. Alongside the report, based on a series of forecasting scenarios, we can recall Rachel Carson's text, Silent Spring, translated into Italian exactly 60 years ago and showing the damage already done Carson and (Gastecchi 1963). In addition, the planetary image of Gaia, proposed by James Lovelock, shifted the gaze towards the interdependencies that bind living beings (Lovelock 1979). These are three examples of niches of knowledge that have influenced public discourse, inside and outside the inner circle of science.

Twenty years later the MIT report, in 1992, the first international political summit was organized to counteract human interference with the climate system and stabilize greenhouse gas concentrations in the atmosphere. Known as the Earth Summit or Rio Conference, it ended with a declaration of commitment signed by 154 nations, which then resulted in the Protocols of Action and the Conferences of the Parties, the annual meetings on concrete actions to be taken. If we consider as a regime, "the semi-coherent set of rules" (Geels 2002, p. 1260) that is determined by the action of the most relevant public and private social actors, we can qualify the Rio Summit as a first visible reaction of the regime to the solicitations imposed by the niches of knowledge.

As Aurelio Peccei had predicted, only a boost of public opinion, fueled by young people and intellectuals, can push politics beyond the horizon of the short term and contingent interests (Bologna 2022, p. 26). Severn Cullis-Suzuki, then 12 years old, spoke at the Rio summit to put the environmental issue from the perspective of young people, belonging to the generations following those of the decision-makers (We Canada 2012). Too early to influence world public opinion, unlike Greta Thumberg, whose protest in 2018 reverberated thanks to the internet, involving millions of young people in over a hundred countries.

Thirty years after the Rio summit and fifty years after the publication of the MIT report, we see that not even Greta has produced the desired breakthrough. However, something has changed: the concrete effects of climate change, with their extreme anomalies, have made their way into people's consciousness, generating mixed feelings of uncertainty, fear, and removal of the problem.

I come from a city, Forlì, which last May saw the general collapse of a centuries-old project of territorial engineering, based on the regulation

of rivers and the reclamation of lowland land. Despite the disproportion of everything, a pressing request for restoration has prevailed, although the events had definitively called into question the normality of the previous condition. In this contradiction between present and future, I read the displacement and sense of precariousness that have entered people's common sense and are now part of the cognitive landscape.

THE TRANSITION AS AN INTERPRETATIVE FRAMEWORK

I deliberately made use of three categorizations – niche, regime, and landscape – taken from the descriptive model of sociotechnical transitions proposed by Frank Geels (Geels 2002). Geels' scheme shifts the focus from the content and production process of objects to the set of external relations. The transition is not described as a linear process of conflict between the old (inert and blocked) and the new (bringer of progress), but as the outcome of a complex multi-level interplay. At the bottom of the scheme, innovators can act freely in niches, deviating from current practices. The success of some proposals – seen from a relational perspective – depends on the reaction of the regime, whose key actors play against or in favor due to their positioning (possession of key factors, strength, links with the context) and their expectations (Hanson 2018). In addition, "changes at the landscape level, for instance, may put pressure on the regime, and create openings for new technologies" (Geels 2002, p. 1261).

The transition does not take place according to a bottom-up logic, as opposed to a top-down one. Nor, on the other axis, can we declassify permanence (the legacy of past histories) to a mere factor of friction and resistance to innovation. The different logics interfere within a space-time where a clash between accelerators/connectors and conservatives/gatekeepers is produced, and coalitions and behaviors are redefined. As noted by a Finnish study (Lukkarinena J. et. al. 2018), innovation is facilitated by how the connection between meaning and agency occurs through knowledge gathering and education, acceleration in application (opening new markets, creating new jobs), legitimation, and networking.

PLANNING IN TRANSITION

In the first section we described how, from a historical perspective, the desired change in knowledge niches is reverberating in the regime and the landscape, but with times and ways that do not seem adequate to the urgency and depth of the necessary changes. Later, we focussed on the indications by Geels and the Transition Studies for decoding complexity and capturing some turning points that offer support for positioning ourselves in uncertainty without passively suffering change. In this last paragraph, we try to answer the following question: if we consider planning as an intentional action aimed at influencing future decisions, how can we place it within an open, dynamic, and interdependent system of relationships to help accelerate change?

Two planning contents seem to be directly linked to the issues implicit in Geels' scheme: the envisioning embedded in the projective dimension of plans, made explicit through scenarios and projects, and the agency incorporated in the so-called social production of the plans.

If we look towards the niches of innovation, plans can act as a catalyst, to foster their emergence and action in the clash. Angela Barbanente formulated some considerations in this regard, because of her experience in the formation of the Regional Landscape Plan of Puglia, which she promoted and coordinated as an urban planner and councilor for planning (Albrechts, Barbanente, Monno 2019).

In the Apulian case, the technical part of the plan (composed of an Atlas, a Strategic scenario, and a Statutory setting including the transformation rules) was consciously conceived as part of a broader dispositive aimed at soliciting the emergence of innovation niches promoted by grassroot organizations (community-based action groups and local environmental associations), many of them youthful. Practices and projects for the protection, restoration, and use of landscape and cultural heritage have been included in a circuit of collaboration with public administrations, intentionally built to ensure a space of legitimacy within the framework of meaning and action set by the Plan.

If we look towards the center of the scheme, where the action-reaction of the socio-technical regime takes place, some considerations by Alessandro Balducci may come in handy (Balducci 2011). He starts from the observation that urban planning acts in a context of high technical uncertainty (there are no univocal solutions) and political uncertainty (there is no authority that imposes decisions on other actors). Even assuming a strategic posture, the management of planning processes is still uneven and there is no single arena where to deal with problems.

Through its envisioning, the plan can play a role, offering an original point of view on the future that unveils and activates a potential inherent in a place. The use of a different interpretative lens can build trading zones (Galison 1997), functioning as a code, accepted and understood, that allow a "discourse capable of intercepting the objectives and interests of different actors" (Star and Griesemer J. 1989). The dialogue, facilitated by the perspective introduced by the plan, with the rules and projects linked to it, is necessarily partial: it cannot be enclosed within a single crystallized final hypothesis, nor can it aspire to a generalized consensus, as difficult as it is ephemeral.

The perspective, however, can build the conditions to join relevant actors around individual projects that can fuel the change, directly (by diffusion and up-scaling) or indirectly, opening the way to other innovations and creating spaces of opportunity.

Both examples allow us to look at planning as a means that "organizes". As Reinhold Martin (Martin 2019) argues, media are not mere conduits or channels that connect one agent to another but should be understood as "structuring conditions that configure the very possibility of the agency". Therefore, without the presumption of organizing and controlling the future, the social responsibility of planning can be reaffirmed. The "limited rationality" of the plan (linked to technical appropriateness and argumentative capacity) can be put outwards not through the imposition of overall

coherence or the search for a contingent consensus, but rather by offering an explicit positioning to which corresponds a field of initiatives.

To bring this perspective back to the dynamics of relations with the planet mentioned at the beginning, precautions must be taken. The image of fire coming to life with surprising violence (Pyne & Frediani 2022) effectively conveys how, locally, the latent energy of the planet is activated and released by the modifications we have made so far. Turbulence and disconnections question our ability to impact reality and the appropriateness of the adaptation and regeneration paradigms to which formal urban policies refer. We now have fragments of possible discourses but not yet a complete and solid set of knowledge of transformation to which to refer. Perhaps the challenge is to train our ability to recognize and interpret.

As we are always in transition, opportunities constantly arise for making room for emerging alternatives through planning. However, to build imaginaries that can be put into fertile relation with the explicit and implicit planning in the action of others, we must act as archaeologists of the future - decoding clues and fragments that we trace in writings, practices, and projects.

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PART I: COOPERATIVE CITY

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The growing interest of all stakeholders in urban planning and production, along with the participatory approaches observed in the current context—whether arising from collective mobilizations or institutional initiatives—provides a broad field for analysis.

The growing interest of all stakeholders in urban planning and production, along with the participatory approaches observed in the current context—whether arising from collective mobilizations or institutional initiatives—provides a broad field for analysis. In a context where pluralistic societies (Castells 1969, p. 415) are emerging and a diversity of actors and territorial transitions intertwine, it is crucial to explore the role and place of cooperative processes in the production of territories. The concept of the cooperative city seeks to rethink traditional urban planning and production by emphasizing collaboration and cooperation among different territories and multiple urban actors, including residents, associations, businesses, and public institutions.

The topic of participation has been embedded in the field of public action for about forty years, particularly in relation to urban planning, notably within the theoretical framework initiated, among others, by Sherry R. Arnstein's work on the ladder of participation (1969). Furthermore, the procedural approach to planning from the 1970s and 1980s in Anglo-Saxon research critiques rationalist approaches and views the role of planning as that of managing the process of formulating judgments in planning, rather than as someone with specialized expertise to make those judgments (Taylor 1999, p. 330). This shift aligns with the development of the collaborative approach as an alternative to the rational planning model, continuing the reflections initiated in the 1960s on citizen participation in decision-making and "advocacy planning" (Davidoff 1965). Thus, the focus is on how to incorporate citizens' voices while preserving the role of professionals and technical experts.

Urbanism and urban planning, as levers of action on territories, immediately question the power dynamics, issues, technical and expert knowledge, as well as usage patterns, in a framework aimed at enhancing participation and collaboration. The uncertainty inherent in the concept of transition underscores the importance of rethinking urban design and production to address the diverse needs of various stakeholders. Rethinking tools and processes to overcome the exclusion of certain actors and their positions, and to include these often-silenced voices in the debate, can trigger more

inclusive and versatile urban imagination processes (Lynch 2006). This theme places the democratic question at the heart of urban production and collective management practices, as well as cooperative practices.

Thus, this chapter doesn't aim to provide a comprehensive review of research on public participation in urban planning and urban studies, but rather seeks to explore the various forms of cooperation, whether institutionalized or not, as well as practices at different scales, both European and local, while considering diverse territorial contexts.

The first presentation examines the impacts and potential spatial effects of projects funded by the European Territorial Cooperation (ETC) in the coastal cities of Southern Europe to address climate change challenges. It explores the ability of these projects to account for the specific characteristics of coastal urban areas and the strategies to enhance their contribution to the transition towards urban sustainability.

The second part of this chapter examines the spatial characteristics of the transition of learning spaces, using the Sardinian territory as its framework. This presentation aims to integrate territorial analysis into the study of educational scenarios, considering both institutionalized and non-institutionalized educational practices.

A third contribution examines the evolution of the status of housing, shifting from that of a "home" to that of a "commodity," in the context of a housing crisis, and considers its potential transformation into a status of "commons." The article is based on an analysis of the city of Belgrade, which provides a particularly relevant example for studying these transitions due to its historical context and the effects of its rapid shift from a socialist system to a neoliberal system in the 1990s.

Finally, this chapter focuses on urban planning for manufacturing spaces in the territories of Lille and Brussels. This presentation examines the role of the regulatory planning process in addressing conflicts related to industrial spillovers in urban areas. By relying on a critical analysis of communicative planning approaches, it analyzes the effects of the decision-making process on the tools and zoning implemented.

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1 THE TRANSITION OF EU MEDITERRANEAN COASTAL CITIES TOWARDS SUSTAINABILITY: THE ROLE OF EUROPEAN TERRITORIAL COOPERATION PROJECTS

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In the last decades, many European cities have started a transition towards sustainability, also stimulated by the need to tackle climate change.

In the last decades, many European cities have started a transition towards sustainability, also stimulated by the need to tackle climate change. However, Southern Europe's coastal cities, though highly vulnerable to climate change impacts, seem less resilient and sustainable than central and northern Europe's, in spite of the numerous climate-related EU projects implemented in their territories. An ongoing research within the PhD course "Landscapes of the contemporary city. Techniques, policies and visual studies" intends to investigate how these cities have used projects funded under European territorial cooperation programmes in the period 2014-2020 to support their ecological transition, and more specifically, what specific territorial features of these cities have been addressed so far and with what physical effects (if any), and how the effectiveness of these projects can be strengthened. This work presents the literature on the different topics addressed by the research, with the aim of highlighting the research gaps and identify the "research niche" to be developed.

1·1 INTRODUCTION

The research "Interreg 2014-2020 and the climate transition of coastal urban areas in Mediterranean Europe. State of the art and new opportunities for the period 2021-2027", currently in progress within the PhD course "Landscapes of the contemporary city. Techniques, policies and visual studies", intends to investigate how coastal cities in Southern Europe have so far used projects funded through European Territorial Cooperation (ETC) to address climate change challenges. Research questions revolve around the impacts and physical effects (if any) of these projects, their capacity to address specific features of coastal urban areas, and the possible ways to strengthen their role in the transition towards urban sustainability. This document aims to frame the ongoing work within the wider strands of research dealing with the different topics at stake: urban sustainability, cities' response to climate change, Interreg and its implications for urban areas.

Therefore, the first part of the working paper explores the category of urban sustainability and its links with the concepts of climate change mitigation and adaptation, justifying the geographical scope of the research through an overview of the climate change situation in Southern European coastal cities.

The second part frames urban sustainability within EU policies up to 2020, with a focus on ETC programmes.

The third part summarizes previous research strands on the above-mentioned topics, highlighting the research gaps identified so far and the next steps of the research.

1·2 URBAN SUSTAINABILITY TRANSITION TO TACKLE CLIMATE CHANGE IN SOUTHERN EUROPEAN CITIES

In the last decades, the transition towards sustainability has been a key challenge for European cities.
In an increasingly urbanized continent, where over two-thirds of the population lives in urban areas (EEA 2019), cities account for about 80% of energy use and are responsible for at least 70% of global carbon emissions, but they represent at the same time a key opportunity to accelerate progress toward ambitious climate goals (IEA 2021).

The notion of sustainability originates from the 1987 report of the United Nations' Brundtland Commission, defining it as "meeting the needs of the present without compromising the ability of future generations to meet their own needs". The application of this concept to cities has been widely investigated by international organizations and scholars, resulting in a plethora of categories that, though embedded in different conceptual frameworks, are often used interchangeably (de Jong et al. 2015). Such categories include i.e. Sustainable cities (UNEP 2002), Eco-cities (UNDP 2010; Suzuki et al. 2010), Green cities (Lindfield et al. 2012), Climate neutral cities (UNECE 2011), Low-carbon cities (DTI 2003), Resilient cities (UNISDR 2012), Resource-efficient cities (UNEP 2016), Smart cities (Caragliu et al. 2011), etc. Though differing in scope, these terms seem to share, from

the environmental standpoint, a common vision of the city of the future, having limited or nullified GHG emissions, resilient to negative climate change impacts, capable of ensuring health, prosperity and liveability to its inhabitants without depleting ecosystems and resources.

In a broader sense, "Urban environmental sustainability includes encouraging revitalisation and transitions of urban areas to improve liveability, promote innovation and reduce environmental impacts while maximizing economic and social co-benefits" (EEA 2021). A sustainable city is therefore "low-carbon, green, resilient, circular, inclusive, healthy" (EEA 2021) [fig.1].

Starting from this comprehensive definition, this paper focuses on the response of cities to climate change, in terms of both mitigation and adaptation, assuming that the efforts of the cities to become low-carbon and resilient at the same time are, at the least, the first essential steps in their transition towards sustainability.

Dealing with Climate change effect has become increasingly urgent for cities in the last decades. European cities are hotspots for multiple risks of increasing temperatures and extreme heat, floods and droughts, and the negative impacts of fast-rising warming in Europe [fig.2] are expected to be particularly acute in southern regions (Bednar-Friedl et al. 2022).

Coastal urban areas are especially vulnerable to climate change impacts such as inland and coastal flooding; windstorms; heatwaves (exacerbated by the urban heat island effect), water shortages and drought; enhanced air pollution; geo-hydrological hazards such as saltwater intrusion and landslides (UNEP/MAP 2017). Coastal cities along the European shores of the Mediterranean are no exception, but in spite of this, they seem to be less ready to face these impacts than those in central and northern Europe.

This can be hinted, for example, by their low placements in European rankings such as the Cities SDG Index, the Green City Index (EIU 2009) and the Green Capital Award (which only this year has awarded a Mediterranean city, Valencia). South European coastal cities also place low in global rankings like the Arcadis Sustainable Cities Index (Arcadis 2022) ①, with only two Mediterranean coastal cities (Marseille and Barcelona) among the top 50, and none in the top 10. Moreover, previous research on European cities' climate change response has shown a remarkable north-south gap in climate planning, with Southern Europe regions lagging behind (Reckien et al. 2014; Sharon & Ronen 2020; Salvia et al. 2021) and thus appearing unprepared to face climate challenges, although with some exceptions (e.g. the already mentioned Marseille and Barcelona).

It is worth noticing that such gap persists today in spite of the numerous initiatives on climate topics implemented in Southern Europe using EU funding.

1·3 URBAN SUSTAINABILITY TRANSITION POLICIES EUROPE AND THE ROLE OF INTERREG

The EU has been addressing sustainability issues at least since 1997, when sustainable development was included in the Treaty of Amsterdam as an overarching objective of EU policies. EU sustainability policies have

accelerated in the last decade due to the increasingly urgent need to tackle climate change. Sustainable development and climate topics have been gradually mainstreamed into EU policies and legislation, i.e. through the Sustainable Development Strategy (2001), the Green Paper (2007), the White Paper (2009) and the 2020 Strategy (2011), up to the more recent Green Deal (2019), the EU Adaptation Strategies (2013 and 2021), and the European Climate Law (2021), formalizing the goal of reaching climate-neutrality by 2050.

In parallel, the EU has been promoting urban sustainable development, by creating the conditions for ad-hoc agreements among Member States (of which the most recent are the 2016 Urban Agenda and the 2020 New Leipzig Charter), and by sustaining the establishment of thematic networks (i.e. the Urban Development Network, the Smart Cities Marketplace, the Covenant of Mayors, Climate-ADAPT, etc.).

Operationally speaking, the EU has put in place funding mechanisms to support Member States and regions in achieving climate targets, and help cities in their sustainability transition. The main one is the European Regional Development Fund (ERDF), which contributes to finance:

- Regional Operational Programmes, managed by regions to fund local projects addressing region-specific topics, including sustainable energy and urban regeneration;

- ETC Programmes (Interreg), which support bottom-up projects promoted by international consortia cooperating at cross-border (Interreg A), transnational (Interreg B) and interregional level (Interreg C) on topics relevant to involved regions and to overarching EU policies;

- Initiatives and programmes targeting urban areas, which evolved from the Urban Pilot Projects (1989-1999) and URBAN (1994-2006) that funded single urban regeneration programs, to URBACT (since 2002), fostering cooperation, knowledge sharing and capacity building within thematic city networks, up to UIA – Urban Innovative Actions (2015-2020) and to the more recent European Urban Initiative and Driving Urban Transition (2021-2027), for testing innovative solutions to urban challenges [fig.3].

The focus of this paper is on ETC/Interreg Programmes, which have been addressing environmental topics since their debut in 1990, but have included climate mitigation and adaptation among their top priorities only in programming period 2014-2020. Indeed, approximately 3.9 billion euros, around 30% of the total Interreg budget for that period, were allocated on themes explicitly related to the environment and climate, i.e. resource efficiency, low-carbon economy, adaptation and risk prevention [fig.4].

A targeted search of the Keep database ● shows more than 800 Interreg projects addressing such topics in the 2014-2020 period only. Approximately 200 involve Southern European coastal regions, with more than 350 million euros of total EU contribution. The question arises whether this ‘deployment of forces’ has had any significant impacts on the environmental and climate performance of coastal cities in Mediterranean Europe.

1·4 INTERREG AND CLIMATE CHANGE RESPONSE IN SOUTHERN EUROPE COASTAL CITIES: A LITERATURE REVIEW

To verify the positioning of the research, a literature review has been conducted along two parallel tracks. On one hand, previous studies on the cities' climate change response have been surveyed, in order to verify if coastal cities of Southern Europe have been specifically investigated under this lens, and if the contribution of EU-funded projects has been considered. On the other hand, studies and reports regarding the implementation and evaluation of Interreg Programmes have been examined, to assess how the links between Interreg, climate-related themes and urban issues have been explored, and if (and how) concrete results of Interreg projects on cities' sustainability have been analysed. This has led to identify multiple strands of research in both domains.

1·4·1 Cities' climate change response

A relevant research strand regards the policy aspects of climate change response, and focuses on the ex-ante evaluation of local climate planning instruments, considered as a sign of a city's readiness to respond to climate change. Various scholars have conducted extensive quali-quantitative comparative analyses of the targets and the types of measures foreseen in local mitigation and adaptation plans, taking into account wide samples of cities with a varying geographical scope, from the global level (Olazabal & De Gopegui, 2021) to the European one (Reckien et al. 2014, 2018), down to the Mediterranean area (Salvia et al., 2021) (Pietrapertosa et al., 2022) and even to national contexts (Salvia et al. 2014) (Pietrapertosa, 2018). However, the ex-ante nature of these studies does not allow for an analysis of the results achieved and of the possible role of EU funding in the implementation phase, and, even where the coastal location has been a sample selection criterion (Olazabal & De Gopegui, 2021), coastal cities of Mediterranean Europe seem to be not sufficiently represented. Moreover, it could be argued whether the existence of climate plans can be taken as a guarantee of the actual implementation of significant climate-related actions and, therefore, of the effectiveness and incisiveness of local climate policies.

Another important field of investigation considered regards the operational aspects of climate change response, often resulting in the collection, classification and comparative analysis of mitigation and adaptation measures implemented in cities. Such analyses are numerous, though they seldom consider the coastal location as a selection criterion. A partial exception is represented by research on mitigation and adaptation in port cities, analysing i.e. measures to increase coastal resilience (Valente & Veloso-Gomes 2020) or improve energy efficiency in ports (Sdoukopoulos et al. 2019) (Iris & Lam, 2019) (Bjerkan & Seter, 2019) (Carpenter & Lozano 2020). However, this kind of research often focuses more on technical and logistics aspects of port activities than on the effects of such measures on the city as a whole. This is also due to the peculiarity of port management procedures, often estranged by urban planning processes and instruments (De Martino, 2021).

In general, literature on urban environmental sustainability and urban response to climate change seems to have neglected to investigate the contribution of EU-funded projects to the matter. Moreover, previous research seems to have addressed climate mitigation and adaptation mainly as two separate topics, in spite of the fact that they are often considered as interconnected, i.e. as in the European Commission's Mayors Adapt initiative, supporting local authorities in reaching both climate mitigation and adaptation targets.

1·4·2 Implementation and evaluation of Interreg Programmes

Previous studies on Interreg can be grouped in three macro-categories.

The first one addresses the relationship between Interreg and European Spatial Planning (ESDP) ●. Studies on this macro-theme are numerous but, in general, authors have agreed upon the substantial failure of the European Spatial Planning concept in informing the design and implementation of ETC programmes (Janin & Rivolin 1999; Waterhout & Stead 2007; Faludi 2018), resulting in the incapability of ETC Programmes to effectively territorialize EU policies. On the other hand, it is suggested that the European debate on spatial planning underpinning the ESDP served to trigger innovation and 'Europeanization' in the member states' planning context and practices (Giannakourou 2005), and stimulated regions and local actors, particularly in Southern Europe, to "experiment with new forms of inter-institutional cooperation and negotiation and mutual learning" (Janin & Rivolin 2003), mostly through Interreg. In this sense, Interreg can be considered successful as it serves as a stimulus to innovate existing practices and test new ones within a common supra-national framework.

A second macro-category concerns the monitoring and evaluation of Interreg programmes (Haarich et al. 2019; Knippschild & Vock 2017; Russo et al. 2019), including official evaluation reports. In general, authors agree on the methodological challenges of the ex-post evaluation of such programmes, and on the difficulty of assessing their actual results. In particular, V. Hachmann notes that "Interreg B projects were until now mainly assessed with respect to their tangible results, although large parts of their benefit are of a rather less tangible character, and hence a more differentiated understanding of 'tangibility' is required. The weakness of many summative evaluations lies in their focus on quantitative and easily measurable results and effects" (Hachmann 2011). These considerations may easily be applied to all Interreg Programmes.

A third category of studies has focused on very specific and/or territorially circumscribed cases, i.e. by analysing characteristics and challenges of the different types of Interreg – cross-border (Medeiros 2009; 2018), transnational (Hachmann 2011), and interregional (Briot 2021) – or the outcomes of single programmes or projects. Most studies on the contribution of Interreg to climate change mitigation and adaptation fall under the third category, thus lacking a more comprehensive vision. Available thematic reports mainly result in generic comparative or budget-based analyses (INTERACT 2019; EEA 2018), or in mere projects catalogues (INTERACT 2020). A qualitative analysis of the concrete contribution of Interreg Programme as a whole to the enhancement of the environmental

and climate performance of cities seems to be lacking, particularly when considering clusters of cities with common geographical characteristics.

Within this framework, it seems relevant to start from the coastal location along the Mediterranean as a crosscutting criterion to analyse climate-related results of all Interreg Programmes, especially in cities where projects funded under different Programmes overlap, which can be taken as case studies. In Italy, a sample of such cities (namely Genoa, Trieste, and possibly Bari) will be the subject of a quali-quantitative, multi-scalar analysis of overlapping Interreg and other EU-funded projects, combined with interviews with relevant local actors. This is expected to provide insights on the interaction of Interreg projects with local sustainability transition paths and on their possible physical impacts, with a view to the wider role of the cities within the EU spatial context. The final aim is to identify the gaps to be filled for defining more incisive mitigation and adaptation projects.

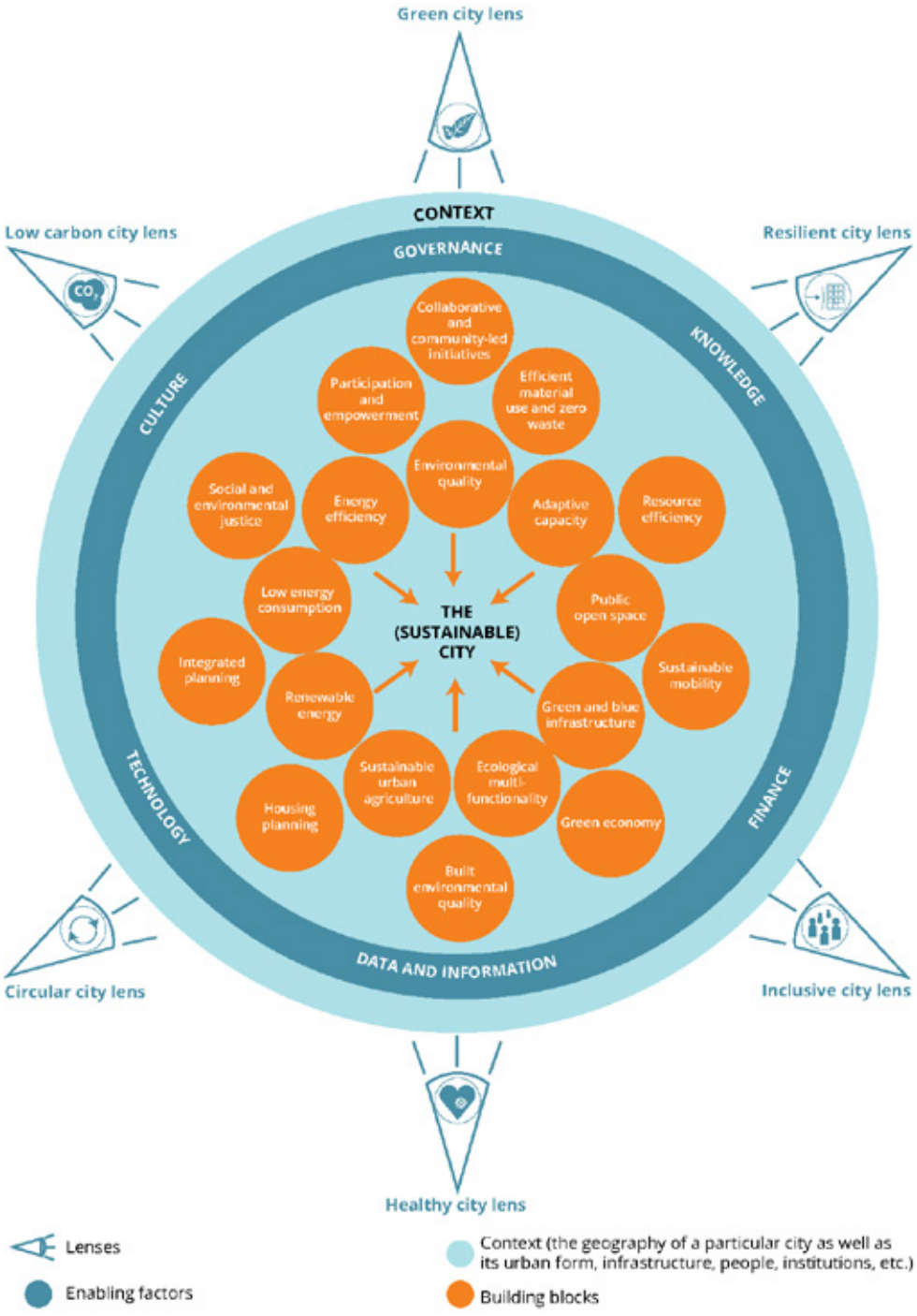

fig. 1. Conceptual framework for urban environmental sustainability. Credits: European Environment Agency, 2022.

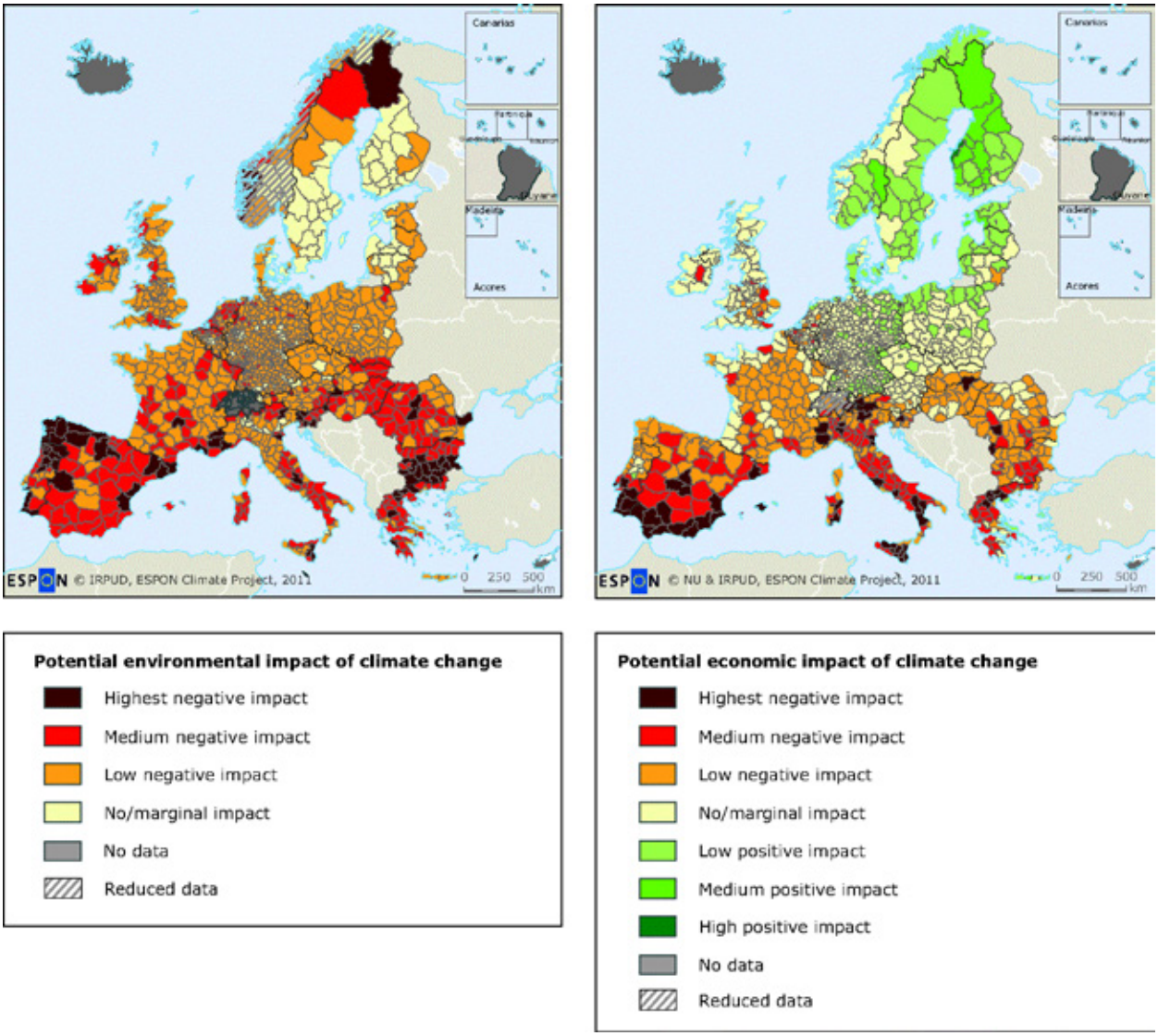

fig. 2. Potential impacts of climate change in the EU. Credits: ESPON Climate, 2011.

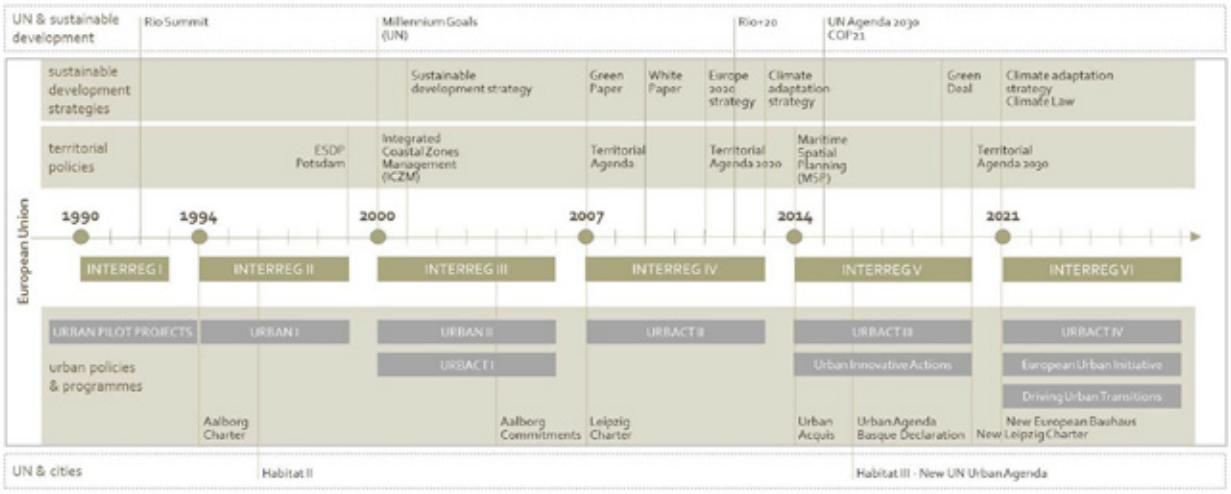

fig. 3. Interreg framed within EU and UN policies on sustainability, territorial and urban matters. Credits: elaborated by Federica Di Pietrantonio.

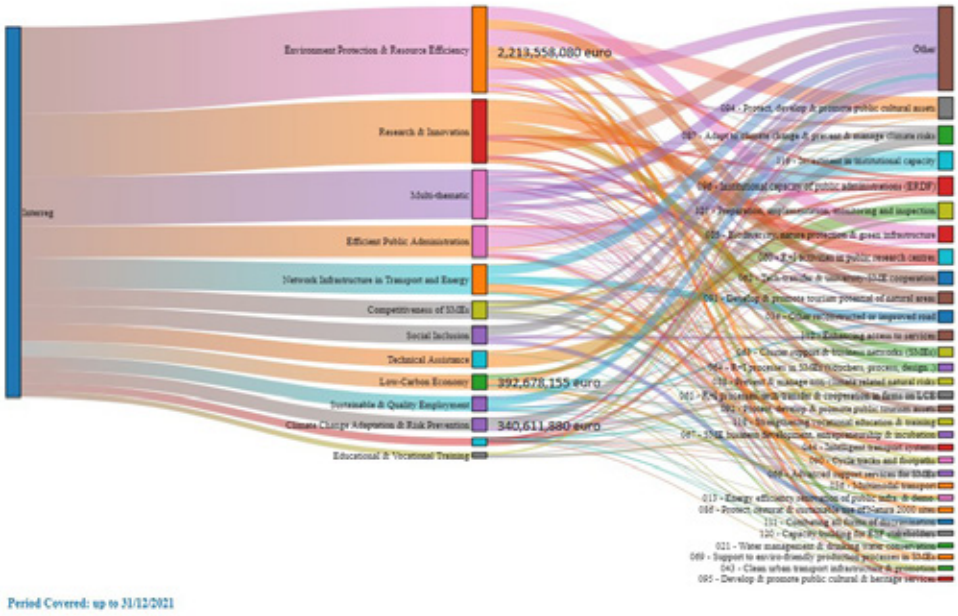

fig. 4. Planned allocation of ERDF financing to Interreg 2014-2020 by themes. Credits: https://cohesiondata.ec.europa.eu/.

ENDNOTES

①: The Arcadis Sustainable Cities Index evaluates 100 global cities against three 'pillars' corresponding to the three dimensions of sustainability: environmental, social, and economic.

●: The Keep database (https://keep.eu/), built and managed by the Interact Programme with the support of the European Commission, collects aggregated data on projects and beneficiaries of EU cross-border, transnational and interregional cooperation programmes.

●: The ESDP - European Spatial Development Perspective was adopted in 1999 in Potsdam (Germany), by the Ministers of EU Member States responsible for Spatial Planning, who reached agreement on common objectives and concepts for the future development of the EU territory. The ESPD was meant to represent a policy framework for the EU's and the Member States' sectorial policies that have spatial impacts, as well as for regional and local authorities in charge of spatial planning.

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2 SCHOOLS [NOT] DEAD. A COLLECTION OF SPATIAL ELEMENTS AND ACTIONS TO DESIGN COLLECTIVELY DIRECTED SCENARIOS IN THE INDETERMINACY OF TRANSITION

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The research investigates the spatial characters of the transition of learning spaces (institutionalized and non-institutionalized), with exploratory work on the Sardinian territory.

With the goal of mass literacy in the post-World War II European context, the school was recognized as the main institutionalized educational infrastructure, while urban space implicitly maintained its role as a lifelong learning environment. Today an educational transition is underway, recognizable as a phase of indeterminacy and experimentation in the interaction between space and learning, with OECD scenarios offering alternatives to the idea of the school as the only institution with an educational role. With three action research and three experiential cases in the Sardinian territory, the research collects a code of recurring spatial elements and learning actions. This code provides characters and rules for a game that engages children in understanding and imagining their learning environment with collectively directed scenarios.

2·1 "WHERE DO THE DUCKS GO WHEN THE POND FREEZES OVER?" (SALINGER, 1951) THE TRANSITION OF WELFARE SPACES' ROLE, STARTING FROM SCHOOLS

Since the 20th century, schools, like other public services, have changed the role they play within society, as well as their programs, spatial conformation, and location (Secchi 2005). With the goal of mass literacy in the post-World War II European context, schools have been recognized as the main institutionalized educational infrastructure, while urban space has implicitly maintained its role as a lifelong learning environment.

Nowadays, an educational transition is underway, recognizable as a phase of indeterminacy and experimentation in the interaction between space and learning, for which the alternative educational scenarios proposed by OECD can be taken as an example (2020). These scenarios offer alternatives to the idea of the school as the only institution to be assigned the educational role: schools extend into the context, explode into alternative spaces, open as learning hubs, and disappear, giving the urban space an incidental educational role. Rooting these possible learning scenarios to the territory, what spatial variables and characters are brought into play? Is it possible to work from existing urban materials?

Urbanism after growth challenges us to select what to invest in design and planning energies and resources (Secchi 2005). This strategic approach has even more relevance in the case of public and welfare space, above all where inhabitants' demands for space do not coincide with the inherited 'equipment park' (Renzoni 2011). This heritage of school spaces is ordinary, widespread, and designed with combined urban materials to fulfill specific needs. Despite its heterogeneity, this stock of public space presents typological recognizability for its design characters and position in the urban and territorial context (Mattioli, Renzoni & Savoldi 2021). Most of this heritage was built during the economic miracle because of the need for equipment for an increasingly growing population. This system of welfare spaces, often due to difficult management combined with the fragility of local institutions (Lanzani & Pasqui 2011), has premature obsolescence: for attractiveness for contemporary sociality uses and for sustainability, due to the characteristics of construction materials selected mainly for the needs of speed and cheapness of implementation.

However, their diffusion, position in the city and territory, and variety of (urban) materials make them an important opportunity to rethink the urban space of our cities. Moreover, they can be potential territorial garrisons in contexts of social variations, composing a frame held together by mobility spaces. In areas where the relationship between population and welfare spaces is lacking, schools can have a double life. As in the OECD scenarios, they can be the trigger for resignification of the role of public spaces, extending outside their educational reverb and working sequentially with the surroundings.

Why is the word transition so common in contemporary debate? Transition is a state of indeterminacy, where one is in the middle between a starting point and a projected goal of arrival in the future. The scenarios proposed by the OECD for the school of the future constitute four alternative possible goals of arrival. On the other hand, the spatial and social

heritage is the starting point. The current phase lies in the middle. The research aims to territorialize these educational scenarios by identifying which spatial elements and actions recur in cases of learning practices. The cases are selected by seeking a dialogue between recent institutionalized educational practices in which schools play a leading role (*campo*, shot) and past non-institutionalized educational practices that have left a still identifiable sign in the imaginary of the local public space (*contro-campo*, counter-shot). The research takes as a sample the Sardinian territory, because of its significant actual and expected social transition and its relevant historical and contemporary (institutionalized and non-institutionalized) practices that involve the community in education and see the territory as a learning environment.

2·2 LEARNING FROM THE SARDINIAN TERRITORY. AN EXPLORATORY SURVEY

The Sardinian territory is identified as a significant case of social transition, because of the expected trends of population decline, the historical and contemporary low-density of population, as well as because of the complex relationship between hinterland and coast that characterizes its post-World War II history and brings out numerous cases of municipalities with intermittent populations and suffering inland areas. The initial methodologic approach used mapping with a perspective from above and below, to restore the complexity and recurrence of the spatial characters of learning spaces in different areas of Sardinia. These characters have been compared with national cases to individuate specificities of the territory and recurrences of the research theme. Certainly, emerging among these fragilities is the one related to disparities in access to services dedicated to education, in part because of municipal and extra-municipal mobility difficulties. These problems are intensified in territories in social transition, becoming significant as early as kindergarten and elementary school, as the low number of students in the country forces educational institutions to gather children from several neighboring towns into a single school to guarantee essential service. The struggle of inhabiting a territory (Tosi 2009) is experienced from the earliest age, becoming a constituent feature of children's daily living, conditioning their perception of the urban space and educational rights. To enrich this inventory of spatial characters, the collection was complemented with two main moments of direct exploration: campo (shot), rereading processes in which the researcher had an active and inside design and pedagogical role, contro-campo (reverse-shot), in which improper schooling (Pira 1978) 'learning paths' were retraced at a longer temporal scale, whose material and immaterial signs are still recognizable. In these cases, physical elements are selected by mapping the learning actions and spaces in which the experiences took place. After a reconstruction of the process and the interactions that connoted it, the urban materials that characterize the different case scenes were identified and divided by layers. These urban materials constitute a collection, related to the actions of interaction with the space by the learner and the nature of the spatial subject identified.

2 · 2 · 1 Campo: three diaries

Three cases of action-research experiences are reread, in which the author had a direct role in designing and carrying out the educational activities involving the schools: *Agri-cultura, I.C. Sinnai 1 – Trento* (2018-19), *Logos Digitales, I.C. Su Planu* (2017) and *Giardino in movimento I.C. Sinnai 1 - S. Isidoro* (2017-19) ①. The three cases focus on three first-cycle schools in the margins of Metropolitan City of Cagliari and their relationship with their open space, threshold, proximity spaces, and surroundings. Engagement processes included different games and several moments of mapping, with cartography and exploratory walks, of designing and transforming the open space with (guerrilla) gardening and tactical interventions.

In the first case, the most involved space was the unused schoolyard, which was designed and modified with the students by enhancing the ecological key, with native, autonomous, or edible plant species. In the second case, the neighborhood became an outdoor classroom, both with walks in the streets and with lessons in the open spaces near the school, which was opened to the inhabitants as a civic centre for sharing the mapping results and the students' projects, which imagined new connectivity for the unrealised welfare spaces. In the third case, the unused space between two schools was imagined from a former farm to a potential shared garden, to be used both for outdoor education and as a public space when schools are closed.

The activities rethought the relationships between institutionalized teaching and alternative learning possibilities that could actively engage children in designing and transforming the spaces they experience daily. Through different funding lines, both regional and national, public and private, these processes focused on making the school connected, open, and collaborating with the territory.

2 · 2 · 2 Contro-campo: three portraits

The research recollected the traces of three learning paths in three different stages of mass education in the same village San Sperate '*Paese Museo*', designed an open-air school by Pinuccio Sciola, through the involvement of other inhabitants and the depositing of signs in the urban space that are still legible. The still legible significant signs inherit Sciola's vision and his tools for manipulating reality: the 'murals' and the 'sounding stones' that make the village an open-air museum for all (Majakovsky 1918).

The three cases intercept urban space and territory with different scales and involvement over time: Pinuccio Sciola (1942), L. (1963), and G. (1989). The first learning path is collected from the Pinuccio Sciola Foundation Archive, while the second and the third are by walking in the village, retracing the paths of the years of formation led by the two interviewed. Emerged a relationship of mutual learning and collaboration between the (also outdoor) cultural spaces and the schools of the village, but also of a wider territory, as a visit destination thanks to the recognisability of the vision of Paese Museo. These spaces sometimes have opportunities for dialogue with the schools, when didactics go beyond the fence and extend into the territory, sometimes they offer an "elsewhere" for learning, with alternative educational modalities that can intercept different skills from those stimulated by institutionalised didactic methods.

2·3 SCHRÖDINGER'S ~~CAT~~ SCHOOL. A SPATIAL CODE OF 'IMPARAI'

In the six different cases of *campo* and *contro-campo*, the research collected the recurrent spatial elements and learning actions. This collection forms a spatial code of *imparai* [SRD: verb 1. learning, teaching], that combines the open and integrated uses of formal schools and the incidental or informal education of improper schooling. This code is used to set the ground characters and rules for a role game to engage young people in understanding and imagining the urban spaces they usually learn from.
This game could be experimented with in schools, in participation processes, or even as an autonomous tool for interpreting and designing space through play. A further step of the research could involve different contexts to understand the recurrences and the differences in the learning experience.

The rules of the game take up the main recurring actions and materials characteristic of learning activities. The actions can be implemented with varying degrees of intensity and conviviality: 'traversing' (wandering, directing, rambling, exploring), 'transforming' (vandalizing, integrating, (de)building, moving), and 'sharing' (gathering, meeting, crossing, searching). The materials (vegetation, fences, cut-outs, paths, equipment, buildings, water) participate in the game as real educational subjects and can be augmented and combined with different intensities and connotations depending on the system of relations with the physical and social context in which they are built-in and the gaze of the player who faces them (fig. 1).

The role game works according to the principle of Schrödinger's Cat: the school can be simultaneously alive or dead, open or closed, incidental or institutionalized, depending on the story defined by the story master and the interpretive keys the players use to make the characters interact. The story master can be a public actor (teacher, administration), a private actor (associations, entrepreneurs, artists), or directly one of the children. The story starts with the definition of the context in which it operates and identifies a design quest. The goal is to stimulate the ability to formulate together conscious space demands and imagine collective educational scenarios that focus on the relationship between space and learning (fig. 2).

2·3·1 Designing with scenarios in the indeterminacy of transition

So, what are (and what can be) the spaces where learning takes place in the indeterminacy of the transition process? Can schools accommodate multiple (sometimes conflicting) uses, users, and natures? Can the territory be recognized as a school? Can school facilities, widespread in the territory, become trigger points for urban regeneration and ecological transition?

The indeterminacy that characterizes the concept of transition highlights the need to rethink urban design in terms of looking for the unexpressed demands of different actors. Experimenting with alternative tools to include these actors in the debate, whose voices remain muted, can trigger more open and versatile processes of imagining the city (Lynch 2006). In this goal of collective self-determination, the involvement of younger people can provide a future and inclusive perspective, enhancing their everyday ability to pretend, an essential design principle that combines aesthetic perception and emotional reaction (Geddes 1915). Play can be an

effective tool of projective imagination, which children experience daily in all its emotional, relational, and physical dimensions. As they play, their perspective on space contains a potential for change, even if only temporary or ephemeral, which works well in a condition of indeterminacy. Moreover, it maintains a possibilistic posture about future evolutions, with the need at the same time to share rules and goals with other players. It improves a receptive attitude necessary for the continuation of play.

Over time, several experiments considered spatial and natural elements as players, such as adventure playgrounds (Ward 1961). They become opportunities for inclusivity, interaction, and proximity of human and non-human populations, sometimes with common goals, other times conflicting. At the same time, being involved in the design and transformation of urban space can give younger people greater capacity for self-determination and awareness of their right to the city (Lefebvre 1970). On the other hand, involving the most fragile and politically unrepresented voices could make the urban design the space for sharing a renewed socio-ecological pact, that keeps together human and non-human demands for space. Embracing this phase of transition, a Copernican revolution shifts the anthropocentric perspective toward a more receptive and versatile design model, with alternative experimental scenarios played under collective direction. Even when it raises conflicts, it represents an example of a desirable paradigm shift that looks at open space in a more inclusive and plural dimension. In this perspective, schools may be open spaces of socialization and territory may be an inclusive and plural educational space.

fig. 1. A spatial code of '*imparai*'. Credits: elaborated by Valentina Rossella Zucca.

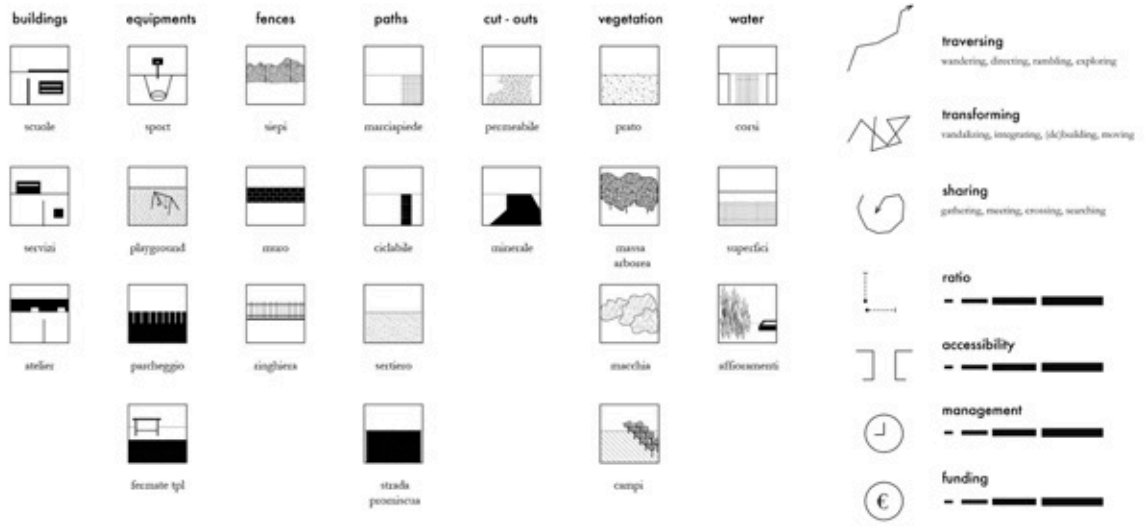

fig. 2. *Fare finta che*. Experimental scenarios on the relationship between space and learning, in which spatial elements become the teachers and students at the same time. Credits: elaborated by Valentina Rossella Zucca.

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①: https://immoi.org.

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3 TOWARDS A TRANSITION OF HOUSING FROM 'COMMODITY' TO 'COMMONS': INFORMAL AND COOPERATIVE NICHES IN BELGRADE

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The shift of housing from ‘home’ – based on its use – to ‘commodity’ – based on its exchange value – is identified as being at the core of the residential crisis by western thinkers who draw on Lefebvre’s application of Marxism to urban space.

In this paper, I borrow Geels’ Multi Level Perspective to frame the housing issue and speculate on a new housing transition, from ‘commodity’ to ‘commons’. I suggest the need to go beyond the critique of the neoliberal housing regime and to look at micro-level niches that can trigger that transition. I then argue for Belgrade being a compelling ground to study forms of resistance, due to the consequences of its accelerated transition from a socialist to a profoundly neoliberal system in the 1990s. Finally, I hypothesise that informal tactics and citizens’ self-initiative in city-building, and cooperative strategies carried out by civil society constitute relevant niches of alternative housing practices in Belgrade. In order to provoke systemic change and trans-scale the local level, forces need to be collectivised at two different scales: from the individual to the local, and from the local to the trans-local and regional.

3·1 A MULTI-LEVEL PERSPECTIVE ON HOUSING

This paper will first address the housing issue from the political-economy perspective, following the western line of thought seeking to adapt Marxism to new socio-economic constellations. I frame this body of work as a critique to the neoliberal housing regime, borrowing Geels' Multi Level Perspective theory (Geels 2002).

Geels developed MLP to explain how technological transitions come about. According to his analytical model, at the meso-level a 'socio-technical regime' is a self-feeding machine that reproduces technical solutions and institutional, social, and cultural routines in a dynamic kind of stability. For a regime transition to happen, two conditions are necessary. First, a 'window of opportunity' needs to open by external pressures from the 'landscape' at the macro-level. Second, 'niches' of innovation need to take advantage of that opening from the micro-level.

In this paper, I borrow the MLP framework from science and technology studies to speculate on how transitions happen in housing [fig.1]. I here define 'housing transition' as an integral shift in the way we produce, build, organise, and appropriate inhabiting spaces. I then argue for the need to go beyond the critique of the meso-level 'regime' and look at 'niches' of alternative housing solutions and inhabiting practices at the micro-level. This allows to identify potential transformative forces that can trigger a crack in the current regime and lead to a new transition in the housing paradigm.

Finally, in the last sections of the paper, I illustrate why Belgrade is a compelling ground to identify strategies for reversing the commodification process. In a context where any government support for non-profitable forms of housing is excluded, the city turned to informal and, more recently, to cooperative housing practices. Belgrade, I argue, is an incubator to assess the possibility for citizen-led housing alternatives to trigger a transition in housing from 'commodity' to 'commons'.

3·2 THE TRANSITION FROM 'HOME' TO 'COMMODITY'

Since the 1970s the transition from 'home' to 'commodity', and more recently to 'asset', has affected a progressively larger portion of the world's housing stock. To get an idea of the scale of the phenomenon, real estate makes up 60% of world's assets, with 75% of these being in housing (Farha 2017). This transition is seen by a body of contemporary thinkers as a major factor in the housing crisis affecting cities across the world (Aalbers 2016; Madden & Marcuse 2016; Rolnik 2019; Stein 2019). Following the 2008 financial collapse and the subsequent worsening of the residential crisis, urbanists, architects, and urban social movements have taken up the concept of the 'right to the city' developed by Lefebvre in the 1960s, while several authors have been drawing on his interpretation of Marxism in relation to space.

Looking at the UK and USA, Madden and Marcuse have argued that the housing crisis is a structural issue resulting from the neoliberal economic system working as intended, rather than from the system not working (Madden & Marcuse 2016). According to them hyper-commodification,

by which the use value of a residential building is subordinated to its exchange value, is at the core of the crisis, with three main factors constituting it. First, the removal of restrictions on housing as commodity – often ambiguously referred to as 'deregulation' of the housing market. Second, housing being colonised by finance through mortgage systems – that is its financialization. Finally, housing being fixed in place but dominated by global economic networks – that is globalisation.

Moreover, according to Stein, a radical geographer who focused on New York, in contrast to the ideology of the 'free market' governments have had an active role in supporting the transition from 'home' to 'commodity' through policies and the allocation of public funds (Stein 2021). He suggested the emergence of a pattern of state implemented strategies, such as dismantling of housing welfare, privatisation of public housing, subsidy support for mortgages, deregulation of rental markets, and urbanisation programs to attract investors.

Rolnik, the UN Special Rapporteur on the Right to Adequate Housing from 2008 to 2014, reiterated the pioneering role of the UK and USA in establishing mortgage systems. However, she went beyond that by describing how those systems have been exported to 'the rest of the world' through the support of international institutions such as the World Bank (2019). The entering of housing into global financial circuits in countries with different economic and political backgrounds meant that they all experienced the consequences of the 2008 recession, making it possible to talk about a 'global' housing crisis. If most thinkers in the North focused on globalising aspects of housing financialization, recently Fernandez and Aalbers (Fernandez & Aalbers 2020) suggested a new interpretation of financialization as a differentiated process reflecting uneven relationships between countries and hierarchical global monetary structures. Moreover, countries with weak welfare systems and political and institutional structures, such as those that have only recently shifted to democratic governments, are less likely to develop forms of control over financialisation.

Thinkers who place hyper-commodification at the core of the housing crisis have revealed the emergence of deriving geographical and spatial consequences such as displacement, worsening spatial inequalities, and the creation of enclaves for the wealthy and tourists. Schmid, who worked with the institute of urban research ETH Studio Basel, has focused on contemporary interpretations of Lefebvre's theories (Schimd 2011). He has located housing commodification into the framework of the wider commodification of urban space, which is leading to the loss of the 'right to urban life' as conceived by Lefebvre: the right to places of encounter and exchange, to access the resources of the city, and the possibility of experimenting with alternative ways of life.

Marcuse has also observed how the claim for the right to housing is being assimilated into the wider claim for the 'right to the city', that, building on the premises of class struggle, is demanded by the oppressed – the poorest strata of urban populations that suffer the most impactful effects of the financialisation of space – and aspired to by the alienated – a middle-income group that feels unrepresented by the current urban structure and the opportunities it offers.

This wave of thinkers recognise housing as a primary and universal necessity, which serves as a basis for the access to a number of social, political and cultural goods. Above all, they argue for an inherent contradiction in 'housing as a commodity' because while everyone needs a place to live, not everyone has the ability to pay for it Madden & Marcuse (2016).

3·3 REVERSING THE TRANSITION: THE DECOMMODIFICATION OF HOUSING

To divert the trajectory of transition from 'home' to 'commodity', Stein looks at the vulnerabilities of the system which is driving it (Stein 2019). The current financial system is based on the premise that real estate prices will continue to rise. Stein sees here a first vulnerability: anything that undermines this rise challenges the basic assumption behind most capital investments (Stein 2019). Looking at New York, the author has identified different strategies to start reverting housing commodification: expansion of publicly-owned housing stocks, taxation attacking speculative housing, financial and legislative support of not-for-profit housing solutions, regulation of alternative land ownership models, and rent regulation (Ibid.). Most of those strategies presume action at the governmental and political level, that means a certain will of change within the current regime. Among those however, the creation of alternative non-commodified models of housing production, such as co-operatives or land trusts, is already contemplated by most legal frameworks, although not always financially and politically supported. This opens up the possibility for civic actors to organise autonomously in 'niches' and promote such models. If the benefits of those isolated experiments are often limited to the ones who initiated them, they have a much wider secondary impact as they enable imaginaries of possible different cities and are demonstrations of housing's potential.

A second vulnerability in the neoliberal housing system is identified by Madden and Marcuse (Madden and Marcuse 2016) in Lefebvre's 'city dweller' as a new political subject: the collective power of inhabitants prevents the full control of housing by the state and the real estate market, and becomes a force for achieving social and urban transformation. According to Fields (Fields 2017), who focused on the financialization of rental housing, the very existence of tenants as 'unwilling subjects of financialization' suggests that there will always be an opposing force to the realisation of the complete commodification of housing. This resistance from within has developed in the form of spontaneous protests, the strengthening of urban social movements and the birth of new civil actors in the housing sector. By studying urban social movements from across the world, Mayer (Mayer 2011) emphasised the potential of their convergence under the claim for the 'right to the city' following the discovery of the 'local' as the place where globalisation materialises in the 2000s.

The investigation of those vulnerabilities is crucial as it exposes possible loopholes in the neoliberal housing 'regime'. Yet at the same time, I argue, we need to go beyond the meso-level and identify 'niches' of housing alternatives that can take advantage of those openings and trigger cracks in the

'regime', as the 'regime' will always tend to reinforce itself if not disrupted by micro- or macro- level forces (Geels 2002).

Recently Stein (Stein 2021) has been invited to talk about his work in Serbia, on the occasion of the 'Terrestrial Forum' organised by Ministarstvo Prostora, a collective working in Belgrade on citizens' participation in city-building and housing issues. The author's visit to Serbia is perfectly inserted in the debate over the applicability of lessons learned from western cities on capitals in the Global South and peripheries of the Global North. After Stein's presentation, the debate with actors involved in the housing sector in south-eastern Europe underlined local differences despite a convergence of consequences due to neoliberal polices. What emerged was that forms of resistance need to be informed by local contexts, with differentiated strategies reacting to this global phenomenon (Stein 2021). In the following section I will argue that Belgrade is a compelling ground to study emerging 'niches' of resistance.

3·4 BELGRADE AS AN INCUBATOR: HOUSING FROM COMMON GOOD TO INDIVIDUAL STRUGGLE

In relation to the historical Marxist imperative of the procession from capitalism to socialism to communism, Belgrade becomes an interesting case as it has already experienced an attempt of state socialism, calling for a different perspective. In Belgrade, housing went from being a common good to becoming an individual struggle and commodity in a compressed time of 30 years.

After the WWII the fall out between Tito and Stalin, and the founding by Yugoslavia and India of the Non-Aligned Movement, enabled the creation of a 'Third Way', distinct from centralised Soviet state socialism. The Yugoslavian socialist model combined elements of both communism and capitalism. Society was structured around the principles of 'workers' self-management' and 'societal property', with Basic Organisations of Associated Labor being responsible for housing provision (Sekulić 2013), while the State was guarantor of equal access to it. The right to housing and its societal responsibility were recognised by law and considered imperatives guiding society. In the 60s, housing was at the heart of the Yugoslav political program, embodied in the building of New Belgrade [fig.2] as the new modernist socialist capital (Topalović 2012).

After the dissolution of Yugoslavia during the 80s and 90s, with the abolishment of 'self-management' and economic liberalisation housing transitioned to a personal responsibility, and the housing stock in societal property was privatised. Marčetić (Marčetić, I. 2022) draws here an interesting parallelism with the dismantling of welfare systems in western Europe and, in particular, with the privatisation of public housing in the UK under Tatcher's policies. Those European trends have had a significant impact on policies adopted in ex-Yugoslav countries, together with the imposition of macro-economic restructuring by the World Bank and the International Monetary Fund (Marčetić, I. 2022).

Belgrade shares its socialist past with cities from ex-Yugoslavia such as Ljubljana and Zagreb. What makes Belgrade experience unique however

is that while other cities from eastern and south-eastern Europe started a process of integration in the global market economy and the EU soon after the fall of previous political systems, Serbia was put under embargo and severe sanctions for a decade (1990s-2000). This isolation led to the failure of the establishing of a consolidated democratic state and civic society, and the parallel flourishing of informalization and hyper-liberalisation.

If informal building had its precursors in Belgrade already during socialism, it boomed in the 90s with the dismantling of the societal housing production system, the non-existence of a real estate market, and the influx of migrants from former Yugoslavian regions [fig.3]. Self-building was the only housing solution available to many and informality became a stable and credible form of institution (Zeković, Petovar & Nor-Hisham 2020; Grubović 2006), establishing itself as the new 'norm' (Sekulić, 2013). When authorities tried to stop the informal phenomenon at the end of the 90s, new laws had the effect of discouraging self-building by 'ordinary people'. However, in a system that was corrupt at all levels of administration the extra-legal became a negotiating practice which success depended on the political or monetary power of the investor. The takeover of the informal by elites and businesses signed the marriage between informality and neoliberal urban policies (Sekulić 2013). In Belgrade, capitalism and developer urbanism today have opportunities that wouldn't be possible in a fully democratic framework, with endless doors opening for investors to profit at the expense of public interest.

The consequence of two decades of profoundly neoliberal policies is to be traced in the current lack of affordable housing solutions, especially for younger generations that have not benefited from the privatisation of societal housing, which proved to be a 'one-time solution' (Timotijević & Aksentijević 2022; Ministarstvo prostora 2023). Following the systemic break with the socialist past, the only recognised and supported housing model today in Serbia is homeownership, with individuality in the personal sphere ideologically reflecting new nationalism at the country-level (Sekulić 2013). The socialist housing provision system was substituted by a newly born real estate market in the 2000s, which offer has never managed to address real demand as it rather addresses opportunities for profit. In 2009, the new Law on Planning and Construction put publicly owned land on the market and strengthened the government's role in urban issues as an investment facilitator and initiator of major projects, such as the Belgrade Waterfront [fig.4]. The entrance of foreign banks in the Serbian housing market brought new financial products, while loans in foreign currencies provoked large scale indebtedness due to the uneven growth of the value of currencies and average Serbian incomes (Ministarstvo prostora 2023). At the same time, social housing policies are weak and aimed at supporting only a narrow segment of the population, while the absence of regulation makes the rental market subject to fluctuations. As a very recent example, the war in Ukraine has pushed rental prices sky-high because of the influx of both Russians and Ukrainians with significantly higher purchasing power than the average Serbian population.

Belgrade today represents the climax result of unregulated and uncontrolled neoliberalism, with the government and investors walking hand in hand. In this context, the development of any non-profitable form of

housing cannot depend on state-support, making the city a compelling ground to study emerging, citizen-led forms of resistance.

3·5 INFORMAL AND COOPERATIVE 'NICHES' OF RESISTANCE IN BELGRADE

If we apply the MLP framework to housing, at the micro-level 'niches' of innovation are to be found in alternative housing processes and inhabiting practices which develop outside the neoliberal regime. During the transition – both political and of housing – two forms of resistance have emerged in Belgrade that I argue can be understood as 'niches' that have the potential to destabilise the dominant housing system.

On the one hand, informality has been a direct response to housing needs during its first phase of development in Belgrade (1980s-early 1990s). Although at a later stage it assumed a speculative role, it can be interpreted as a form of direct participation of Lefebvre's 'city dweller' in shaping the urban environment. The informal housing phenomenon represents a first resistance practice to be looked at, as it was able to destabilise the dominant regime for a certain period of time.

On the other hand, the work of civil society in the field of housing and the alternative models to real estate that they promote provide a constellation of 'niches' of experimentation and innovation. In a context where the state has given up its role as guarantor of the right to housing, where homeownership is widely accepted as the only secure housing model, and where there is a shared binary view of 'socialism = collective housing' vs. 'neoliberal democracy = individual housing', a dense network of civic actors in Belgrade, and across the Central and South Eastern European region, has taken on the important role of disseminating potential alternative solutions, empowering citizens about their rights in the urban space, and establishing practices for the initiation of non-profitable housing.

The hypothesis is that informal and cooperative housing constitute those 'niches' that have the potential to trigger a transition in the neoliberal housing regime. However, a real impact of citizen-led housing models is only achievable through 'niche-cumulation' – borrowing again the term from Geels theory (Geels 2002) – by collectivising forces according to two different strategies: 'up-scaling' from the individual to the organised group – that is, from the single-family informal house to inhabitant-initiated convivial housing models, such as housing cooperatives and land-trusts; and 'trans-scaling' from local civic organisations to trans-local networks – that is, from the experience of the single group to the sharing of knowledge and tools as common resources. In a society which has actively been fragmented in its smallest cells in the last 15 years, how can we knit again trust in the other, the collective, the city and housing as a common? In order to develop those collectivising strategies, qualitative and participatory research methods are to be applied to investigate existing inhabiting practices, accompanied by in depth collaboration with civil society and actors actively promoting alternative housing solutions.

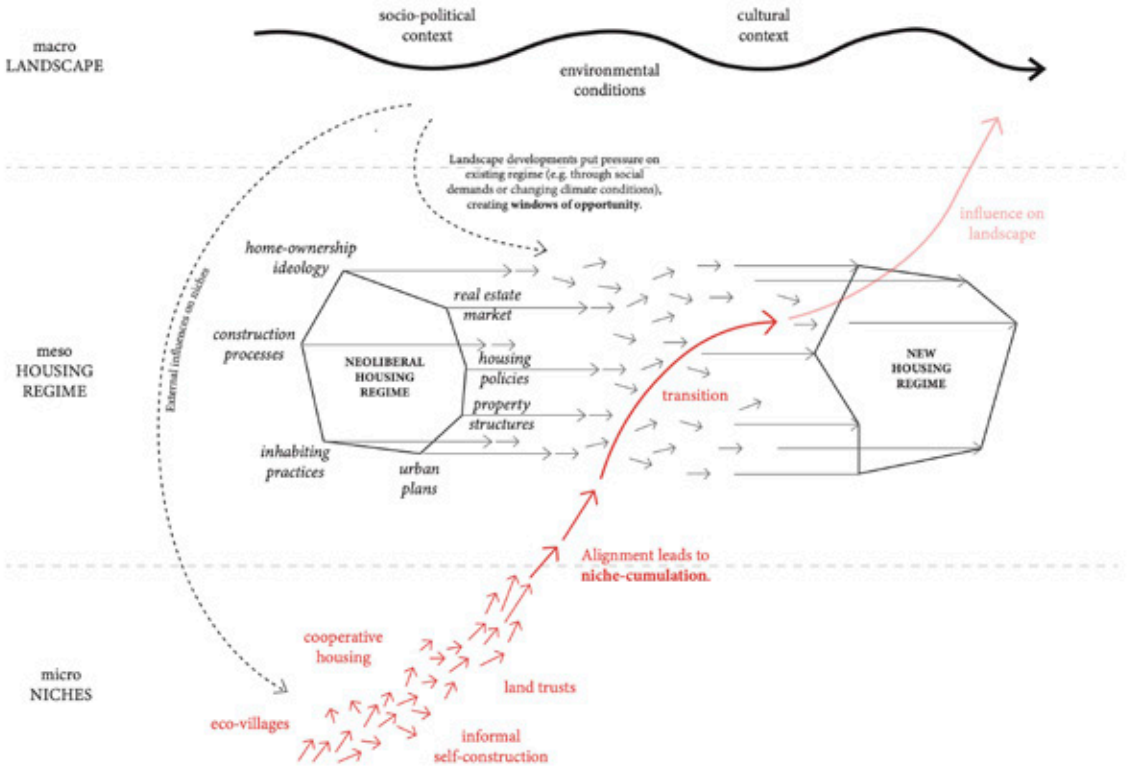

fig. 1. A dynamic multi-level perspective on housing. Credits: the diagram is a reinterpretation of Geels' MLP illustration (2002) elaborated by Maria Minić.

fig. 1. Block 45, built in the 1970s in New Belgrade, was one of the most successful Yugoslav socialist housing projects. Credits: photo by Maria Minić.

fig. 3. View over Kaluđerica, the oldest and largest informal settlement in Belgrade. Credits: photo by Maria Minić.

fig. 4. Belgrade Waterfront, currently under construction, is the emblem of developer urbanism. Credits: photo by Maria Minić.

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4 CONFLICTS AND INTEGRATION OF MANUFACTURING SPACES IN METROPOLITAN TERRITORIES: AN ANALYSIS OF PLANNING APPROACHES IN BRUSSELS AND LILLE

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The dynamics of the recomposition of the geographical distribution of manufacturing activities are generating reflections on the integration of manufacturing production spaces within urban environments.

However, this integration of industrial activities within the metropolitan territories reveals the conflict inherent in the relationship between these activities and the city. More specifically, we ask how regulatory urban planning considers the conflicts inherent to urban functions and the spillover of manufacturing activities? We will first highlight the conflictual aspects inherent in the planning process, then look at the communicative approaches developed in the context of the elaboration of planning documents in Lille and Brussels. Finally, we will analyze the effects of the decision-making process on the tools and zonings put in place in the framework of regulatory planning for the manufacturing space.

4·1 INTRODUCTION

The territories of the Brussels-Capital Region and the European Metropolis of Lille highlight, in their strategic and regulatory planning documents, an objective of developing and maintaining industrial activities ①, in the logic of economic and environmental transition. Moreover, the challenges of urban renewal and specifically those induced by the reintroduction of industry in dense urban areas raise questions regarding the substantial urban transitions in the change of the development model and the urban fabric. However, the eviction of manufacturing activities in cities is characteristic of the tensions and conflicts between residential and manufacturing areas since the 19th century. The loss of surface area and industrial land in Brussels between 1997 and 2011 represents one million m^2 (De Beule et al. 2012), while in Lille, since 1983, one third of manufacturing activities ● have disappeared from the constituted urban fabric, much of which has been ex-urbanized (Agence de développement et d'urbanisme de Lille Métropole 2019). These are both conflicts due to the 'spillover' of industrial pollution and nuisances (Barles, Guillerme & Lestel 2009; Bécot 2019; Fressoz et al. 2014; Le Roux 2009; 2014; Letté & Le Roux 2019; Massard-Guilbaud 1999). Moreover, the effect of competition between different urban functions, generates urban development focused on the production of housing and office space and a particular interest in real estate investors for these same activities deemed more profitable (Strale 2017). These conflicts tend to be overcome by distancing manufacturing spaces from housing spaces through regulatory approaches (Massacesi 1966). This conflictual framework is part of an economic context, of tertiarization specifically (Bell 1999; Bost 2014; Bost et Messaoudi 2017; Hecquet 2013), and an objective of attractiveness of urban territories, which favors an imbalance in the implantation of manufacturing activities (Orban, Trenado & Vanin 2021).

This paper is part of a global questioning considering the conflicts that drive the integration of manufacturing spaces within metropolitan territories, in the framework of urban planning. More specifically, we ask how regulatory urban planning considers the conflicts inherent to urban functions and the spillover of manufacturing activities? We will first highlight the conflictual aspects inherent to the planning process, then focus on the communicative approaches developed in the framework of the elaboration of planning documents in Lille and Brussels. Finally, we will analyze the effects of the decision-making process on the tools and zonings implemented in the framework of regulatory planning for the manufacturing space.

4·2 CONFLICT IN URBAN PLANNING

Recurrently, the conflict is apprehended by its visible manifestation, concretized by a protest action (Coser 1982), a situation (Charlier 1999; Larrue, Melé & Rosemberg 2013; Melé 2013), which is expressed through multiple forms such as through legal aspects (Lussault 2001; Torre et al. 2006). This reduction of conflict to protest would participate according to

Mössner & Renau (Mössner & Renau 2014, p. 65-66) to the in-visibilization of conflict in the logic of idealization of consensus. A more encompassing reading of the concept of conflict, based specifically on considering the taking of positions and words, makes it possible to apprehend conflicts that have not yet acquired an organized form (Bulle et Tarragoni 2021). Thus, conflict is observed through these different forms of opposition, antagonisms and competition, based on distinct logic (D'Alessandro 2013). Urban planning as a social, institutional and technical process and practice, aims to ensure control, regulation and the organization of the territory, and therefore reveals itself of a fundamentally conflictual character. The most obvious register of this conflict is the competition for space, in terms of ownership, use and control (Fainstein et DeFilippis 2016, p. 118; Harvey 1976, p. 294). This conflict for space is the result of a double dynamic of inclusion and exclusion of uses and functions operated by urban planning (Mazza 2009, p. 131; Pacchi et Pasqui 2015, p. 82) that can be related to the concept of "invasion" developed by McKenzie (McKenzie 2009, p. 162).

The object of the conflict inherent in urban planning is particularly characterized by its political nature and by the balance of power it generates through its decision-making character (Davidoff et Reiner 1962, p. 109). In the context of decentralization and participatory democracy, i.e., of "increasing empowerment of subsystems in society" (Le Galès 1995, p. 59), urban planning incorporates the consideration of conflicts through the implementation of negotiation tools aimed at the elaboration of compromise (Castells 1969, p. 415). In this sense, the theory of communicative planning sees the role of planning as "managing the process of making planning judgments" (Taylor 1999, p. 330). In this sense, the role of planning as a decision-making process is to set up a deliberative framework and more consensual decision-making tools capable of overcoming conflict through the establishment of an informed dialogue.

This work focuses on the role of communication, interaction, and dialogue, or collaborative rationality in terms of Innes and Booher (Innes & Booher 2015, p. 204). Pløger (Pløger 2017) categorizes them into three central approaches: reformist, procedural, and neo-radical. The "reformist approach" focuses on participatory approaches, where the role of planning is that of mediation, for consensus building, approach as proposed by Laws and Forester (Laws and Forester 1993; 1999; 2013), Innes and Booher (Innes and Booher 2015). The "procedural approach" which advocates negotiation and collaboration (Mäntysalo, Balducci & Kangasoja 2011). The "neo-radical planning" approach that draws on Healey's (Healey 2003) concepts of reflective communication and relational planning (on the one hand), being based on Hillier's (Hillier 2002; 2007) work on post-representational theory and strategic navigation (Hillier 2011). A renewed approach tends to understand conflict, not through its resolution, but through its democratic role in planning decisions, involving a diverse and plural audience. In this sense, work on agonistic conflict and agonistic planning theory is concerned with conflictual consensus (Mouffe 2014, p. 16), which aims to create "new hegemonic articulations" (Mouffe 2014, p. 16) considering the emergence of new forms of democratic institutions.

The process and the practices of public policies represent a form of 'institutionalized collective action', which are part of a cognitive and

normative framework for the production of decisions and instruments, the aim of which is the implementation of these public policies (Mouffe 2014, p. 16). In this sense, this article aims to analyze the consideration of conflicts related to industries in regulatory planning documents, through a double prism centered on the role of the process of elaboration of planning documents and on their content, apprehended as a discursive element.

In this context, the view of planning documents in our research considers them, on the one hand, as the transcription of the vision that the intermunicipalities ● propose for their territory and, on the other hand, as the means they envisage for spatial action. In this sense, we plan to focus on the practices and forms of material mediation that the actors implement to understand the way in which the visual instruments and means contribute to the fabrication of different urbanistic rationalities. The comparative reading of the planning documents of Lille and Brussels is completed by the analysis of the legal and institutional framework of their elaboration. Semi-directive interviews with the actors in charge of the elaboration of the regulatory planning documents enrich the study of the moments of negotiation, and dialogue set up within the framework of the elaboration process of these documents.

4·3 COMMUNICATIONAL APPROACH IN THE PLANNING PROCESS IN LILLE AND BRUSSELS

The communicative approach is becoming recurrent, in Lille and Brussels, in the implementation of both planning documents, and major urban projects (Hubert et al. 2017), and is materialized by the rise of the practice of public inquiries, participation (Delmotte, Hubert & Tulkens 2009; Delnoy 2005) and consultation procedures (Bacqué et Gauthier 2011; Subra 2018). This phenomenon can be associated with two dynamics: the fragmentation and complexity of the decision-making actor network, on the one hand, and the opposition of inhabitants to certain urban decisions on the other.

The Plan Local d'Urbanisme (PLU) of Lille and the Plan Régional d'Affectation du Sol (PRAS) of Brussels are regulatory urban planning documents that determine land use zones, on the inter-communal scale of the 95 communes of the Lille metropolitan area in the case of the PLU, and on the regional scale comprising the 19 communes of the Brussels region, in the case of the PRAS. Both are the regulatory transcription of strategic planning documents - the Schéma de Cohérence Territoriale (SCOT) for the Lille metropolis, and the Plan Régional de Développement Durable (PRDD) for the Brussels-Capital Region - whose elaboration is based on a communicative and negotiation approach, as part of a process of public inquiry and consultation. The fragmentation of public policies and players observed in France is part of the decentralization policies, with the introduction of the public inquiry procedure in 1983 as part of the first Decentralization Act. In Brussels, the public inquiry procedure made its appearance in 1990, as part of the Organic Ordinance of Planning and Urban Development. Long before this date, as early as 1976, concentration

and information procedures accompanied the drafting of urban planning documents, notably for the sector plan of that same year [fig.1].

However, beyond these institutionalized forums for consultation, governed by the legal framework, negotiation mechanisms are emerging on the bangs of these regulations, particularly during the development of projects linked to urban planning documents. The stages of consultation with stakeholders, as defined by the legal framework, are perceived by these players as moments requiring a high level of involvement because of the inherent stakes involved. This heightened awareness encourages stakeholders to engage in informal exchanges to deepen their understanding of the issues at stake. Also, legally prescribed consultation phases are subject to strict standards, requiring arbitration and positioning. This requirement gives rise to the need for prior phases of dialogue, aimed at calming opposition during consultations ④, which takes the form of workshops and meetings with various stakeholders, often initiated by the authority responsible for drawing up the planning documents. Thus these planning approaches are based on communication processes, information sharing (as a link between knowledge and action) and on the relational dimension between stakeholders, notably in the logic of relational networking and complex problem-solving (Purbani 2017). These communicative approaches to planning are superposed on rational approaches.

The process of drawing up these documents involves a multiplicity of stakeholders [fig.2] [fig.3]. Their antagonistic interests and priorities constitute the conflictual character of the decision-making process, through the articulation between conflicts of recognition, conflicts of interest and conflicts of values (Pacchi et Pasqui 2015, p. 84). In this communicative framework for planning manufacturing spaces, power dynamics are present and help to conceal tensions. The actors involved holding control over the research instruments, exert their influence by selecting topics for debate and establishing the rules of dialogue. They are also responsible for summarizing results according to institutional criteria. This dynamic reflects a certain concealment of conflicts, where agents act from a position of power by orienting the debate process according to specific parameters.

The use of participatory mechanisms is also aimed at achieving acceptance, to stabilizing the situation, without fundamentally altering the existing decision-making system. In this way, participatory mechanisms reflect the ability of planning institutions and sectoral players to adjust to the various contradictions and conflicts involved in reorganizing territorial public action, and to broaden their control capacities with the aim of achieving pacification and limiting opposition to, and contestation of, agreed planning documents. In the logic of conflict regulation, consensual decision-making is understood as a guarantee of compliance with prescriptions by the parties involved, particularly the communes. In this sense, the content of planning (definitions, prescriptions and zoning) tends to create a compromise between stakeholders, thanks specifically to its adaptable and flexible nature.

4·4 THE PLANNING DECISION-MAKING FRAMEWORK AND ITS EFFECT ON THE CONTENT OF PLANNING DOCUMENTS

The strategy for the development and establishment of manufacturing activities is characterized by a form of opposition between, on the one hand, the objective of maintaining manufacturing activities with a view to a functional mix within the constituted urban fabric and, on the other hand, considering the inherent conflict of manufacturing activities, particularly in terms of nuisance, pollution or transport flow. This conflict is materialized through the distance of these activities from other urban functions and in particular from housing, translated by specific zoning. In the case of the PLU, the revised version of 2020 reduces the areas to be urbanized in urban extension. Also, the PLU provides for the development of a substantial supply of economic land in the form of urban renewal, amounting to 533 hectares - therefore largely within the existing urban fabric - and in extension, amounting to 649 hectares. The distinction between activities that are compatible with housing and those that are not being intended to determine their location, but beyond classified installations, it remains difficult to define the types and forms of compatible activities and their degree of compatibility with other urban uses [fig.4].

Within the framework of the PRAS, the allocations relating to productive activities can be understood through three types of zoning according to the place occupied by these productive activities: main, secondary or part of a functional mix. These are craft, high-tech, industrial, production, material services and intangible goods activities. Most of the PRAS zoning authorizes the establishment of productive activities within a functional mix, while regulating the maximum floor area for this activity. In particular, the Urban Enterprise Zone (ZEMU) [fig.5], established in the framework of the demographic PRAS (2013), allows the establishment of residential functions within neighbourhoods intended for productive activities. The flexibility in the definition of types of economic activities (in the case of Lille) and productive activities (in the case of Brussels), which is also reflected in the zoning, would allow for the adaptability of the reference system, particularly by the municipalities, especially in the context of opposition by certain municipalities to the establishment of manufacturing activities within their territory.

Mixed zoning makes it possible to crystallize the addition of the various objectives put forward in strategic planning, such as those relating to the development of the housing function, the economic function, services and facilities, etc. The urban planning tools aiming at functional mix can be understood as a strategy to protect against too specific commitments. In this sense, this programmatic flexibility participates both in the implementation of consensual visions and in hiding the conflicts related to manufacturing spaces. The vagueness and flexibility of the discourses put forward in the framework of planning documents are not at the origin of conflicts, but rather the result of the search for a temporal consensus - during the elaboration of urban planning documents. However, these consensual institutional choices are confronted with the competition and conflicts of actual urban interventions. Thus, the latter at the local level are part of a context of competition of functions and contradictions and conflicts of interest

between the different actors; and participate in the constant crowding out of the manufacturing function.

4·5 CONCLUSION

The conflictual nature of manufacturing spaces, inherent in industrial spillovers, tends to be overcome by their distance from central urban fabrics. We have assumed that the consensual decision-making framework of regulatory planning documents influences the prescriptions and tools for the location of manufacturing spaces. Regulatory planning documents, through their discourse and content, support the tendency to circumvent and invisibilize pre-existing or potential conflicts. The logic of compromise influences the adoption of flexible content in urban regulations - both in terms of types of manufacturing space and location - to secure the support of the different actors involved in the planning process, particularly in the case of municipalities. This consensual dimension also contributes to shifting some competition between urban functions from the development phases of the project and production phases of manufacturing spaces. Communication mechanisms, although often perceived as conflict resolution tools, can also serve to reinforce the legitimacy of planners in the context of persistent contestation.

The study highlights the consensus-seeking and power dynamics at work in communicative approaches to planning, which help to conceal and invisibilize the conflicts governing the siting of manufacturing activities in urban fabrics. The communicative approach to urban planning, centered on dialogue and interaction, is superimposed on more rational approaches, seeking to secure social acceptance and promote pacification. However, pacification does not mean the absence of conflict, but rather the consensual, negotiated management of these tensions. Thus, despite the consensual dimension of regulatory instruments focused on functional or economic mixing, conflicts persist and are integrated into the real estate production process and the use of mixed plots, particularly in the case of mixed zoning.

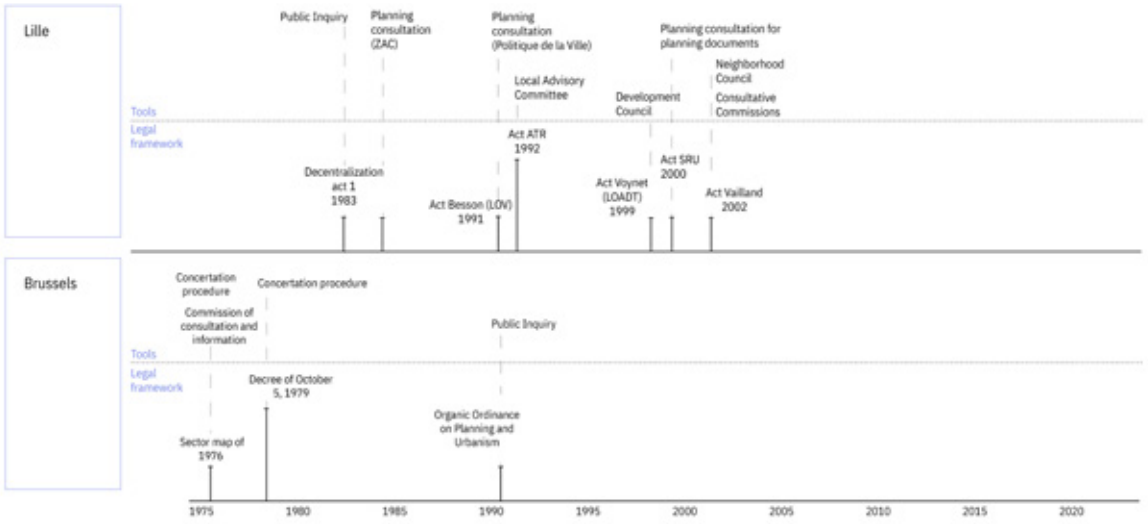
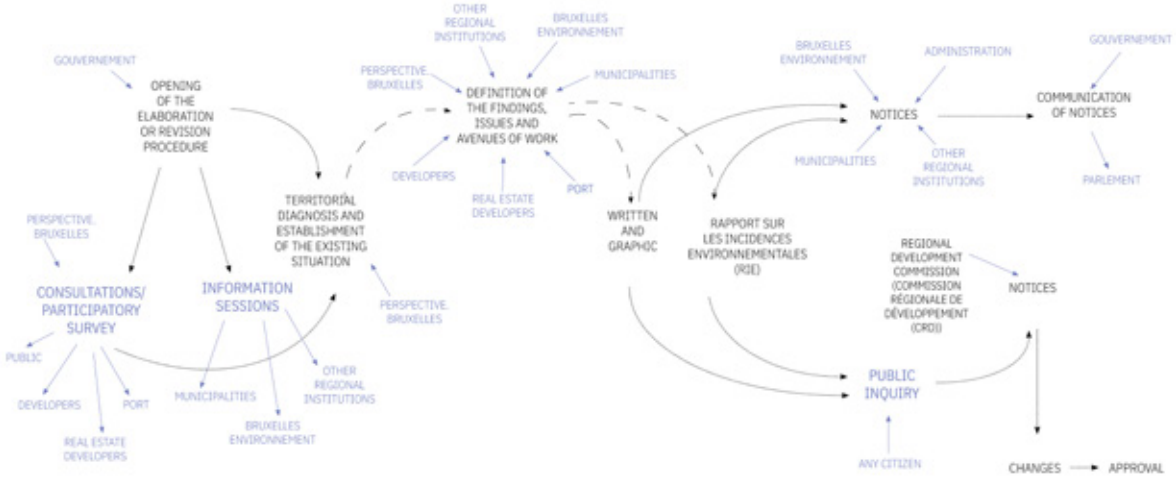


fig. 1. Institutionalization of participatory approaches to urban planning in Lille and Brussels. Credits: elaborated by Ana Scutari.



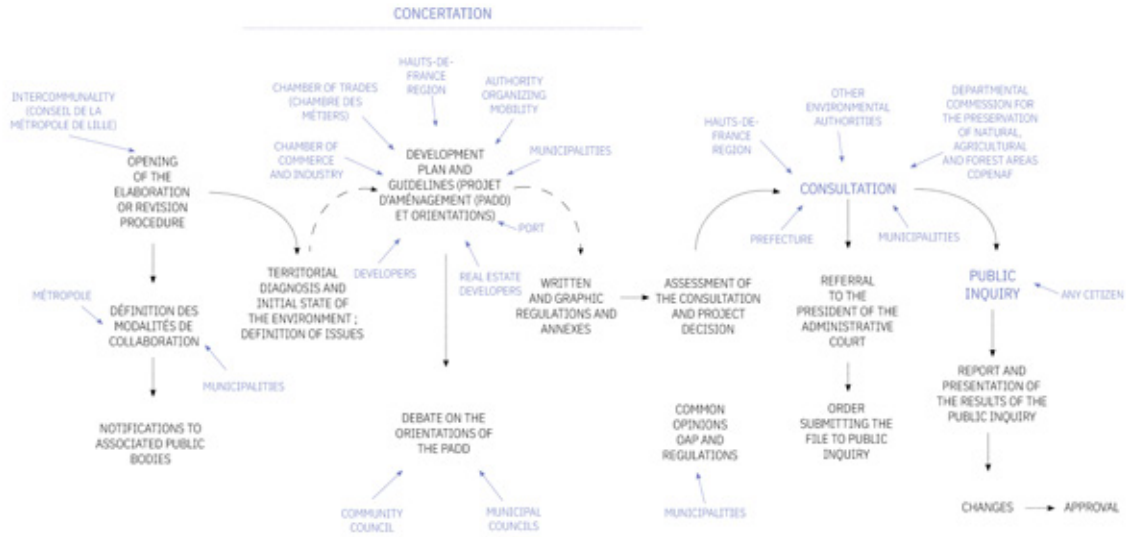


fig. 2. Plan Local d'Urbanisme (Local urban development plan) elaboration and revision process in Lille. Source: elaborated by Ana Scutari.

fig. 3. Plan Régional d'Affectation du Sol (PRAS) elaboration and revision process in Brussels. Source: elaborated by Ana Scutari.

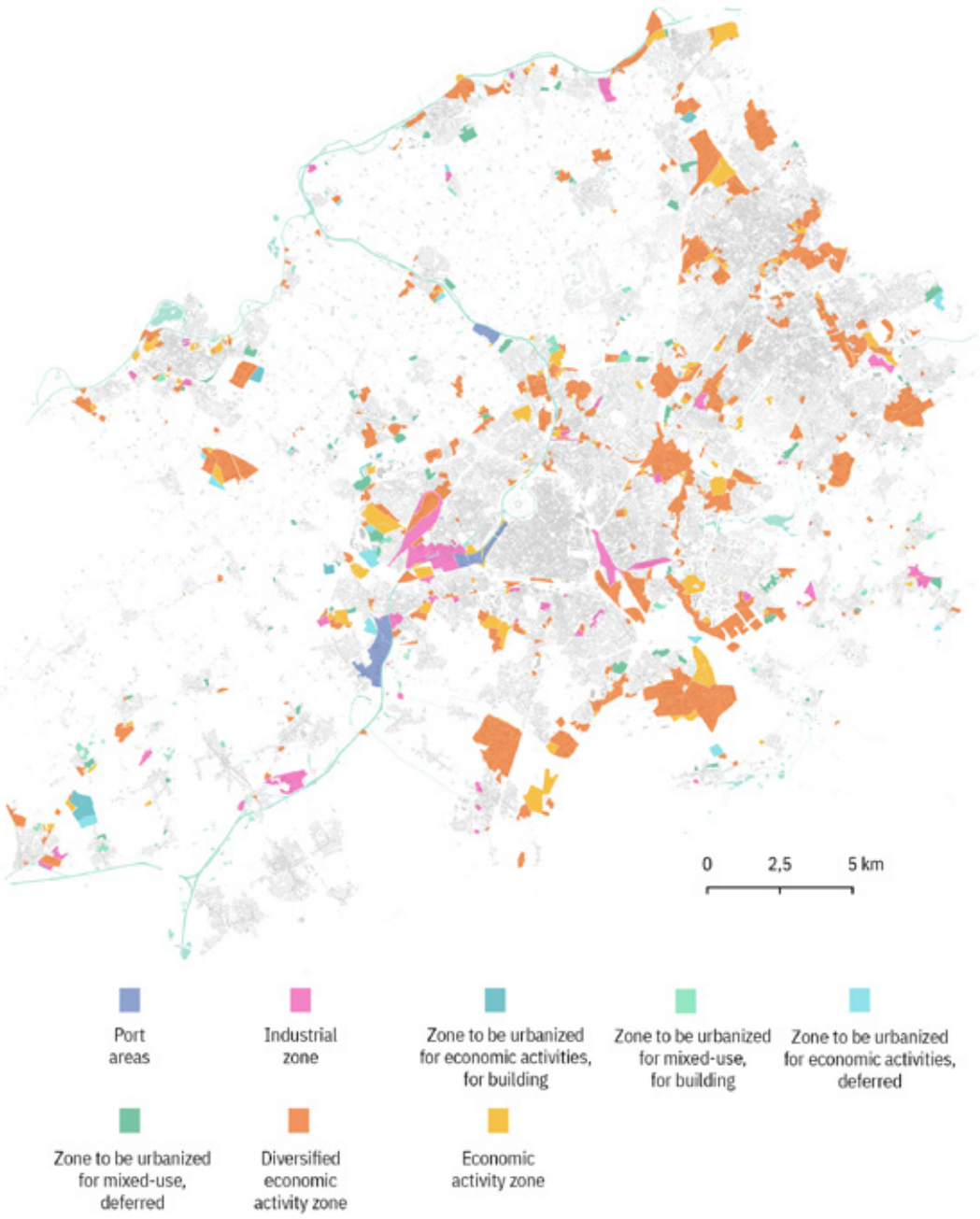


fig. 4. PLU zoning map. Source: data map extrapolated from Métropole Européenne de Lille. Credits: elaborated by Ana Scutari.

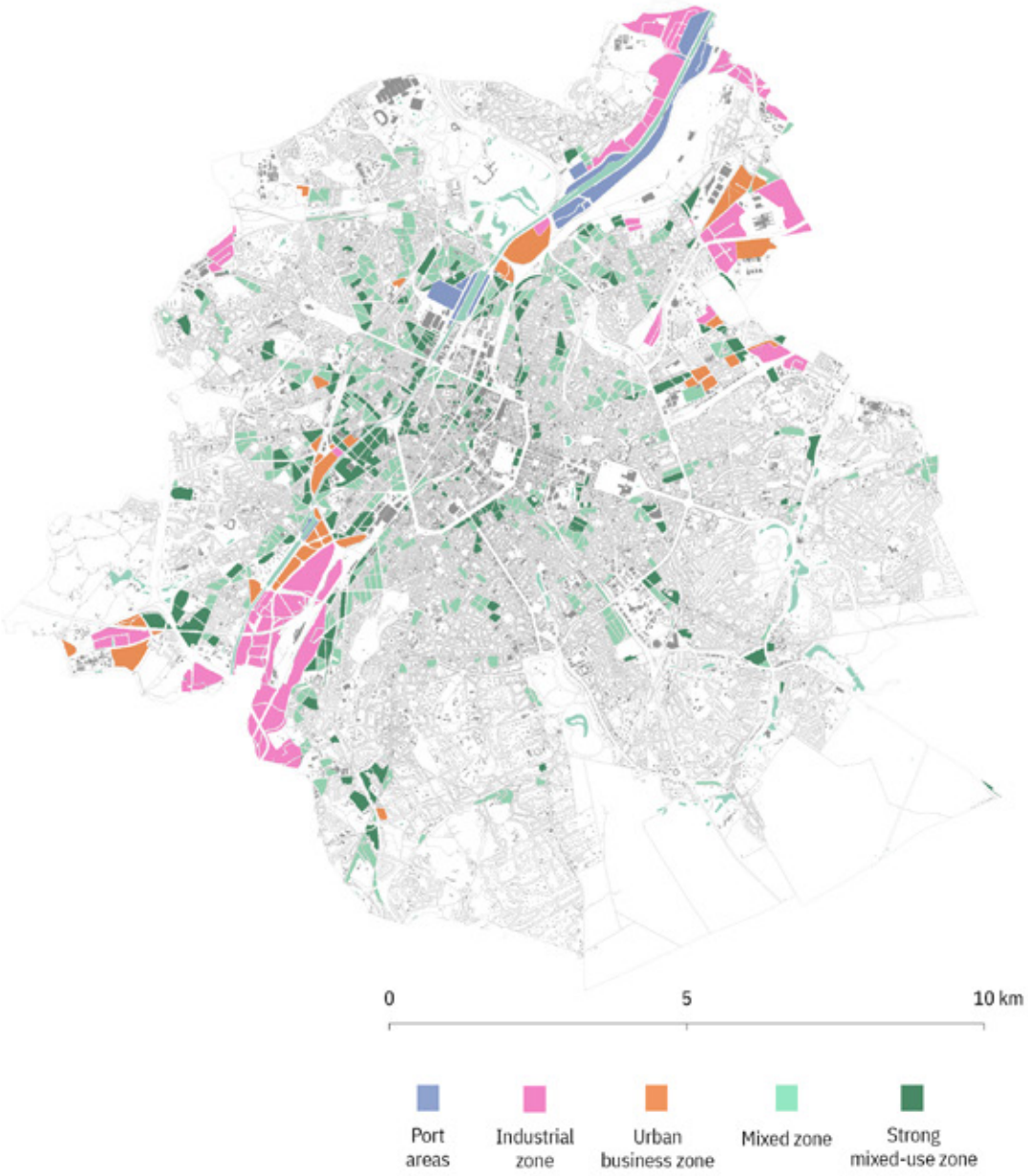


fig. 5. PRAS zoning map. Credits: Perspective.Brussels

ENDNOTES

①: In 2019, the Industrial Plan “Vision and Strategy for Productive Activities” is implemented in Brussels and supports this objective, which is also emphasized in the Regional Plan for Sustainable Development (Plan régional de Développement durable (PRDD)). In Lille, the Metropolitan Action Plan for Employment (2016-2020) emphasizes the objective of developing industrial jobs, and the Territorial coherence scheme (Schéma de Cohérence Territoriale (SCOT)) of Lille Metropole stresses the objective of “an industrial rebound.”

●: These are the activities involved in producing and transforming materials to manufacture tangible, transportable and storable goods. They correspond to the production activities detailed in section C of NACE, as well as waste recycling activities, which are material transformation activities included in group 38.3, entitled "Recycling" in the nomenclature (section E).

●: Usually constituting an administrative urban entity, intercommunalities are intermunicipal structures encompassing several communes (municipalities). In France, the status of metropolises was legally established on January 1, 2015, to define a new model of intercommunality with expanded competences.

④: Territorial Strategy Officer, Perspective Bruxelles, April 18, 2023; Responsible for the PLU procedure, May 12, 2023.

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5 SHAPING THE EVERYDAY CITY: ROME AND THE NEIGHBORHOOD PUBLIC SPACE

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At the end of an era when open space was synonymous with infrastructure, European cities have entered the 21st century seeking to recover a more human and sociable dimension that embodies the concept of everyday life and proximity.

By combining different methodologies, including case studies, GIS-based mapping and interviews with administrators, the paper aims to trace the main features of the city of proximity in Europe in contemporary times, discussing its relevance and application in relation to different scales and urban morphologies. Such considerations lead the paper to consider the different outcomes found by the "Centopiazze Program" in Rome, which constitutes a unicum in terms of territorial dimension. Through an analysis that has involved the citizens of seven different neighborhoods of the city, the research investigates how, in different spontaneous or planned fabrics, the design of open space has been able to hinge on a shared idea of urbanity, and therefore of proximity.

5·1 NEIGHBOURHOOD, PROXIMITY AND LOCAL SCALE

In Europe, debates on urban development have focused, since the second half of the twentieth century, on large scale approached and on the idea of the public space understood as an 'infrastructural space.' Since the 21st century, however, debates have shifted toward the need to recover a more human and sociable dimension which shall embody the concepts of everyday life and proximity. Actually, the last two decades of the twentieth century had already seen a new theoretical attention to the concept of the "neighbourhood," which gained the interest of scholars interested in remedying the acute problems deriving from rapid and chaotic urbanization. The attempt to 'make the city' (Bohigas 1985) on an intermediate scale is, in this phase, operated through the construction of local identities built through the (re)design of the public space. In recent years, new stimuli have led the cultural debate and administrative practices to deal with the public space and the local scale. Inter alia, rising concerns on climate change and the recent pandemic crisis increasingly require us to accelerate the long-awaited transition from 'city of cars' to the 'city of proximity' (Spada 2021).

To this effect, territories in transitions are those evolving today toward new models of cities planned at the local scale, with the aim of being more sustainable, inclusive and livable. The United Nations do, in fact, include cities in point 11 of the Sustainable Development Goals. With the aspiration to "make cities inclusive, safe, resilient and sustainable," attention is paid to the need to contain energy consumption and carbon emissions, and at the same time the intention is to build more inclusive cities by guaranteeing access to home and essential services (point 11.1). Furthermore, the objective of giving "universal access to green spaces and safe public spaces" (point 11.7) reaffirms the importance of open spaces for the development of sustainable cities. In this sense, the public space built around the concept of proximity constitutes an essential and salient feature of the so called 'right to the city,' a modern right of individuals expressed, materially, through cities' accessibility and their proximate use by the inhabitants.

The purpose of this paper is to summarize and provide an overview of the research conducted in the context of my doctoral dissertation entitled "Shaping the everyday city: Rome and the neighborhood public space". The research, indeed, considers the shape of the open space, and thus the design, as the main tool of "city making", as mentioned by Oriol Boighas in 1985, and Bernardo Secchi who spoke in 1993 of an "urban planning of open spaces". The "everyday city" refers to an idea of Public space as part of the "everyday landscapes" included in the European Landscape Convention, article 2. Rome is taken as the major case study because of the spatial scale to which the proximity model is intended to be analysed. Starting from the 90s, in fact, two approaches to the theme of proximity and local scale were experienced in Rome: the Centopiazze Program; the system of Local Centralities in Rome's General Plan.

5·2 PROXIMITY EXPERIENCES

The research targets different kinds of goals. The overall objective is that of examine and compare approaches and tools that have dealt with urban transformation at the local scale over time. The specific objective of the research is to evaluate the results produced in the city of Rome by the Centopiazze Program, investigating, on the one hand, how it has been able to face with the general planning strategies pursued by the administration; and, on the other, the different results collected in the diverse urban contexts the Program has worked on. Moreover, the work sets an applicative objective that is the construction of a GIS collecting all the data related to Roman public spaces. The goal is to provide a tool for the management and monitoring of open spaces in Rome.

The research is divided into three parts. In the first part, the research primarily responds to the need for contextualization of the subject matter of the thesis, building a theoretical framework that refers to the themes and tools implied throughout the discussion (public space, landscape, plans and projects). In the second part, the research focuses on the in-depth study of the Roman case between the 1990s and early 2000s, investigating the relationship between the dimension of the 'project' (with Centopiazze experience) and that of the 'plan' (the Local Centralities). This part of the work was made through the study of documents, interviews with administrators, and the applied analysis developed via GIS. In the third part, the analysis of three European case studies allows the synthesis and definition of the main features of the so-called '15-minute city'. Therefore, the research presents a comparison/experimentation between this contemporary model of proximity (that of '15- minute') and its potential application in Rome's urban context, also carried out through the participatory survey method.

5·3 BETWEEN PLAN AND PROJECT

The theoretical framework was constructed starting from the journals in which the debate on plan and project and the relationship between norm and form, was discussed between the 1980s and 1990s in Italy. The theoretical dimension of "saying" is complemented with the applied dimension of 'doing'. The city of Barcelona is known as a frontrunner in the attention paid to foster the proximity space since 1880s ①. The study highlights how Barcelona overcome the 'urban planning'-'public works' dichotomy. Urban renovation was made through a network of new open spaces able to improve urban quality at the local scale. While many literature classifies Barcelona's public spaces by type, this research chose to investigate them according to the urban fabric on which they fit. After analyze one project for each urban morphology identified, the results highlighted the decisive role of the city's morphological structure on the urban quality achieved through public space design: greater concentration of interventions that favored some areas over others - mainly located in the historic city fabrics; different functions and uses were produced as a result of the interventions depending on the type of 'city context' on which they were inserted.

5·4 ROME AND THE NEIGHBORHOOD PUBLIC SPACE

The analysis of Barcelona case study allowed us to highlight the key points that most influenced the Capitoline administration in the attempt to replicate in Rome, through the "Centopiazze Program", the so-called "Barcelona Model". In 1993 the new administration led by Francesco Rutelli looks to this model and starts a major urban renovation effort. It's important to underline a big change that occurs in the municipality at this stage: a shift from the competence based to the project based administration. In this new scenario, different offices contribute to the implementation of a project, according to a shared timetable: it is not specific competence that commands, rather the common goal. That's the framework in which Centopiazze Program was born. Promoted by arch. Francesco Ghio, the Program brings together under one name all interventions aimed at the renovation, transformation or new construction of public spaces, from downtown to the periphery. Three were the office main objectives: coordinate offices and facilities that have expertise on territory matters; identify forms of financing; streamline administrative procedures in order to speed up the project chain.

At the same time as the launch of the Centopiazze Program, with the "Neighborhood Squares" (Le Piazze di Quartiere) competition in 1996, the Municipality was also working on the new General Plan. The timeline compares the timing of the plan with that of the project and pushes the research to look for points of contact between the two urban strategies. The two systems are mapping on GIS and compared on the issue of: identity; local scale; spatial spread; tools and methods of implementation; choice of areas and location of projects. The result of the analysis revealed a lack of dialogue between the two systems. The consequences were harmful in both cases: on the one hand, many of the new public spaces have not taken root within the neighborhoods, waiting for the implementation of services and functions that would strengthen their centrality; on the other hand, Local Centralities did not find concreteness through the project, being un-perceivable across the city.

5·5 PROXIMITY SPACES IN CONTEMPORARY CITY

The third part of the research carries over the investigation of public space of proximity in the contemporary context. This section is elaborated by firstly introducing a contemporary methodology named "Tactical Urbanism", frequently used at the district level to develop concrete lines of intervention to redesign neighborhoods according to the principle of proximity. To derive the characteristic features of today's "cities of proximity," the study takes the cue from a detailed analysis of three case studies: Paris (La Ville du quart d' heure), Milan (Open Squares Program) and Barcelona (Plan Superilles). These case studies have been selected as explicative of three major examples of interventions dealing with the theme of proximity. But when we compare the three case studies with the city of Rome, the results of the analysis show the weaknesses of some of the postulates of the so-called 15-minute city, especially when applied to an extended urban

dimension that is inclusive of the sprawling suburbs. In fact, the scale and morphological structure of the compared cities highlights the singularity of Rome's municipal area. The main difference lies in the fact that the Centopiazze Program tried to operate on the urban sprawl through the design of public space, producing very different results. Therefore, in the last part, the research investigates 7 places in 7 different neighborhoods of Rome, also by the method of participatory survey. Analyzing public spaces in different urban contexts, from the historic city to the countryside, showed the greater or lesser suitability of the 'square' typology as a tool for improving urban quality at the neighborhood scale. Actually, it doesn't matter if we are in the center or in the suburbs: what has been shown to carry more weight, at the end, are urban forms. Participatory analysis was carried out through the online questionnaire 'Perception of neighborhood public space in the city of Rome'. Results favored public spaces made in more compact morphologies, both in terms of quality, walkability and use by the inhabitants. Overall, low maintenance and a sense of insecurity has been reported in quite all neighborhoods.

5·6 MAIN CONCLUSIONS AND STEP FORWARD

In conclusion, we summarize the main results drawn from the research. As for Centopiazze Program, it is pointed out a lack of monitoring of public spaces; difficulties in the management of public spaces between the Municipality and Local Districts; a need for active monitoring in permanent and decentralized formulas. As for the Local Centralities need for organic and tangible implementation has emerged, as well as the focus on the "visibility" of centrality spaces, also promoted by INU. In other words, it means to recognize, on the one hand, that the coherence of urban transformation cannot be pursued by substituting rules for projects (Gambino, 1991); on the other hand, that the city cannot grow totally outside of spatial planning (Mazza 2012). However, we must assume that spatial planning deals, precisely, with the spatial, morphological aspect and, moreover, with codes and rules that are both consistent and instrumental in controlling the territory. The retrospective study of the Roman experience, the results collected years later, and the methods used, now offer suggestions for the transition of urban territories toward what is now called 'proximity.' This is a topic that has very recently re-entered the public debate, but which, as we could see, has already been addressed in the past by programs and projects that wanted to propose a transition toward a polycentric city, focusing on the neighborhood.

On balance, then, this study provides just few step forward with the aim of improving urban quality at the local scale through better design and management of public spaces: seeking and experimenting with new forms of governance and rules for the management of public space at the metropolitan scale; enhancing the plan-project dialectic with recovery and implementation of a project dimension in the planning process; implementing new tools for management (GIS) and urban design (tactical urbanism) of public space; improving a synergy between academic research and its operational dimension to the ultimate goal of urban quality at the local scale.

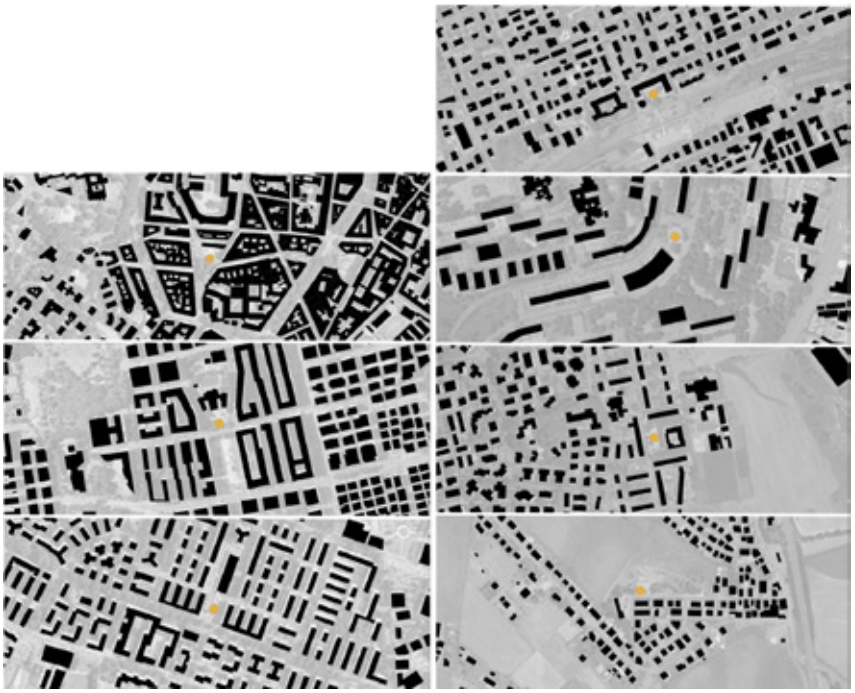

fig. 1. Centopiazze Program (on the left) and the system of the Local Centralities (on the right) were two different strategies used by Rome Municipality to enhance polycentrism and improve urban quality at the neighborhood scale. The programs were compared on: identity, local scale, spatial spread; tools and methods of implementation; choice of areas and location of projects.

fig. 2. Analyzing public spaces in different urban contexts, from the historic city to the countryside, showed the greater oresser suitability of the 'square' typology as a tool for improving urban quality at the neighborhood scale. It doesn't matter if we are in the center or in the suburbs. What has been shown to carry more weight are urban forms.

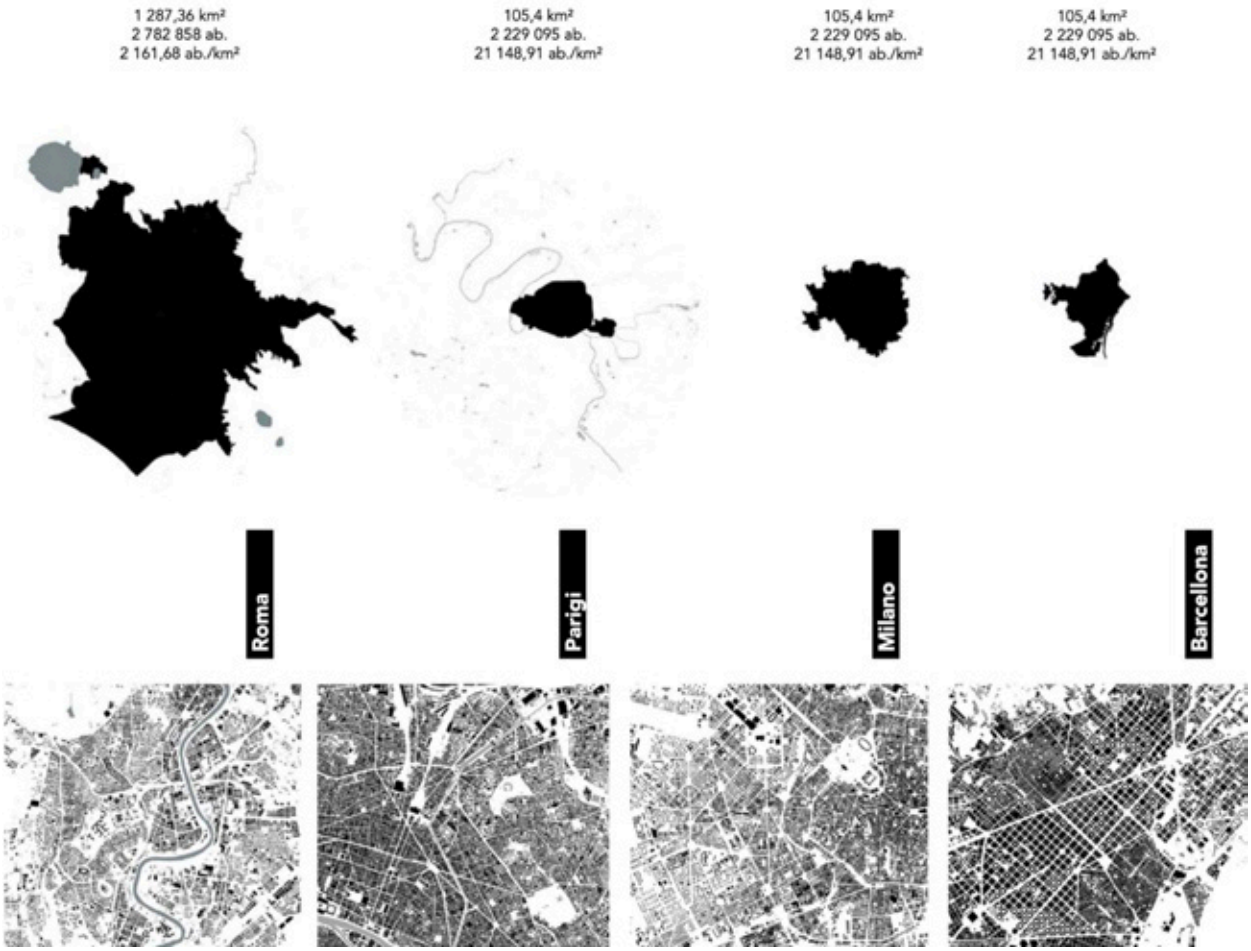

fig. 3. Comparing territories. The scale and morphological structure of the compared cities highlights the singularity of Rome's municipal area. The main difference lies in the fact that the Centopiazze Program tried to operate on the urban sprawl through the design of public space, producing very different results.

ENDNOTES

①: A fruitful insight into the 'Barcelona Model' was possible thanks to a visiting research stay at the Universitat Politecnica de Catalunya, in summer 2021.

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PART II: RESOURCING THE CITY

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The present chapter compiles five contributions which put into question the future of the relationship between the city and its resources.

When defining what constitute the 'city' and its 'resources', the five texts acknowledge the following:

1. The city is considered as a 'city-territory' (Corboz, 1999), which does not distinguish itself in binary opposition to an often poorly defined 'countryside'. In the city-territory, these two worlds are not merely linked within a common socio-technical system (Trist, 1981), but become in fact physically intermingling, often sharing precious land. This condition of planetary urbanisation (Brenner, 2013) can take up many different regional forms (Barcelloni Corte and Viganò, 2022).
2. The city in itself is considered as a renewable resource made of vast and varied quantities of embodied 'grey' energy whose potential is often wasted (Berger, 2006). This resource can be understood in a very wide way, be it in the form of buildings, power generation and mobility infrastructure, mineral riches, ecological features, or communities of residents. Together, they can form vital pieces of territorial infrastructure (Benedict and McMahon, 2006).
3. The city is a place of transition, as stronger resilience towards the destructive effects of climate change is necessary and new demand for technologies and resources to support a departure from fossil fuel consumption emerges. Indeed, ecology has become one of the most influential factors in collective decision-making (Dryzek, 1986).
4. This transition is already happening, as new legislations, large financial investments (both private and public), community-driven projects, as well as ontological shifts in planning practices can already be recorded across the world, yet in a too often fragmented way.

The five following texts, despite covering a wide array of different case studies and specific themes, have been assembled here under the title 'Resourcing the City'. They all make the case for considering the city as a place for new hybridisations through the rewriting of the existing and the integration of the new. Indeed, ubiquitous resources located within the city-territory are undergoing a transition process; energy production facilities, green infrastructure, unoccupied buildable land, the space allocated to the car, or mineral extraction sites tend to take new forms and ask to be re-written and re-contextualised (Genette, 1987) within a wider process of socio-ecological transition. These new transformations may result in sometimes unplanned and often jarring forms of cohabitation. The following contributions will show how, in many cases, these collisions can also be revealed as possibilities for the emergence of new solidarities.

These five texts will finally argue that spatial research, more precisely the tool of mapping, scenario construction and case study analysis can offer precise and relevant insights about the impact of emerging policies which have resulted in sometimes radical, but often unintended morphological consequences on the territory. Indeed, through a careful understanding of a case study – in this case the Veneto region ('Energy Mapping'), the Roman metropolis ('Greening Green Infrastructure'), the Central Valley of Chile ('Re-writing the City'), Berlin and the eastern Belgian 'diffuse city' ('Mapping the Spaces of Automobility'), and the Piedmont Alps ('Collateral Mountains'), – precise hypotheses can be formulated to widen disciplinary scopes, harness the resources of the already-there, and bring different actors together.

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6 ENERGY MAPPING: A WAY TO TERRITORIALIZE AN ACCIDENTAL TRANSITION

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The current energy crisis has brought attention to the confusing process of the energy transition, which should lead Europe towards a more sustainable energy model.

When moving away from the mainstream debate and focusing on a socio-spatial point of view, it becomes evident that energy policies have been conceived within an eco-modern and non-spatial framework, producing an accidental territorialization of the energy systems with critical repercussions. This 'territorial indifference' has led to many 'territorial inertias': trying to manage this situation, many policies and measures have produced a binding planning system, more able to tell 'what and where not to do', rather than adopting a proactive approach allowing the spread of a design culture of transition. A large responsibility of this weakness is the lack of spatial knowledge. Representing energy, its system and the process of transition is quite difficult and so less practised. At the same time the mapping operations are a big challenge to position the vision of transition, to design scenarios and for grasping spatial knowledge for a just and territorialized transition. The paper shows and discusses some spatialization operations of energy systems, and their transition, using the Veneto region as a case study. The cartographies produced are not limited to analytical operations, but also represent possible design tools to regain control in transition processes and starting points to rethink the way we produce, move, and use energy.

6·1 ENERGY WITHOUT SPACE: THE ACCIDENTAL TERRITORIALIZATION OF THE TRANSITION

The current energy transition is the result of a long process that started fifty years ago with socio-economic and geopolitical roots. In Italy, as well as in Europe, the process was strongly increased in 2009: The Treaty of Lisbon introduces the Community energy governance, with binding targets and shared energy policies. The transition process has been organised into strategy packages with time targets (2020, 2030 and 2050), each containing measures and policies that aim to achieve three macro-goals: cutting greenhouse gas emissions, increasing renewable sources in the energy mix, and improving energy efficiency to reduce consumption. To stimulate the pursuit of these objectives an eco-modern scenario was created, which includes several economical tools and strategies. For example, regarding the energy production from renewable resources, programs such as the 'feed-in system', 'green certificates' and 'conto energia' have economically stimulated a large construction of new renewable energy plants. In Italy, from 2009 to 2013, one was witnessing the so-called 'renewables rush': a rapid and dizzying increase in production, which moved from 7,219 MW to over 30,000 MW ①. The transition observed from this perspective represents a success: in just four years, thanks to important economic incentives, energy production from renewables was quintupled, anticipating thus the goals set for 2020.

From a spatial point of view, however, this process takes another relevance: in the same short time, a huge number of new plants were built. The number of photovoltaic plants, for example, have risen from 32,000 in 2009 to over 480,000 four years later (now they are over 1,000,000) ●. The 'explosion' of new plants acquires some importance for spatial issues if we consider that renewable resources, unlike fossil ones, have a lower energy density per km2. Therefore, to produce the same amount of energy, they need much more space (Frolova et al., 2015). Furthermore, renewable resources can be exploited in a widespread way in the territory generating a sprawl of infrastructures (Trainor et al., 2016). These new spatial conditions of energy, combined with the rapid increase in the number of plants, have generated unprecedented and pervasive socio-spatial repercussions on all Italian territories, and so a growing concern about the intense changes that they entail.

These territorial aspects have been neglected by the transition policies: by favouring a technical-economic approach, mostly 'isomorphic policies' (common solutions for similar problems) have been produced, with a 'space-neutrality' based on sectorial rather than the territorial dimension, a top-down approach, as well as dependent on economic incentives, state aids and financial supports (Barca et al., 2012; Chien, 2008).

From this spatial blindness, it is easy to understand how the process of transition represents a chaotic re-territorialization of the energy system with an accidental pulverisation of new infrastructure on the territory. It is also evident that the lack of contemplation of territorial differences has contributed, in a short time, to the consolidation and accentuation of socio-spatial inequalities with new pressures on environments and communities, unfair competition with other land uses, and new territorial

conflicts. The largest part of this critical situation is the lack of spatial knowledge of the energy matter in planning tools (De Pascali & Bagaini, 2018), part of a progressive exclusion of spatial and territorial representation in public policies that standardise, flatten, and extremely simplify any action and measure.

6·2 A MAPPING EFFORT TO RETAKE CONTROL

A territory is always the result of a process of continuous transformation and is made of a not necessarily linear succession of territorializing acts that control the process with different manifestations. Among these, the control of space obtained through representation, defined by Turco (1988) as an act of denomination, plays a fundamental role: by drawing lines of the earth's surface, an actor complicates the world by endowing it with new attributes and creates cognitive and communicative strategies (Turco, 2010). Mapping thus becomes not only a tool of knowledge but also of control and project (Cosgrove, 1999). For the energy transition, spatial representation seems to be a genuine challenge and a smart opportunity to integrate the transition to the territory in a more desirable way (Sijmons, 2014), also becoming a primary tool in decision-making processes (De Pascali & Bagaini, 2018).

But are all spatial energy issues representable? Energy has important non-physical characteristics: it is both intangible and invisible. Indeed, its system is recognizable only in what is spatially configured for its production, its transport, and its consumption. Recognition of these configurations is never immediate because energy infrastructure is often hidden, buried, and camouflaged for functional, aesthetic, and political reasons (Ferrario and Castiglioni, 2015).

These conditions have always hindered energy mapping operations that, in the current transition, are made even more complex. In the past energy paradigm, the infrastructures were concentrated in defined and exclusive spaces, usually very large and with evident objects. Today, these energy landmarks have given place to minute and extremely varied configurations, which are more difficult to detect.

The transition is a constantly changing and uncertain process, which we find difficult to grasp and understand. The re-territorialization of energy systems took place quickly, not giving the time to experiment with forms of representation and monitor actions. Finally, energy is considered a strategic and sensitive sector, so, for commercial, legal, and privacy reasons, many data are not fully accessible, and, because of the liberalisation of the energy market, the fragmentation of the actors has increased the difficulty of collecting and sharing data.

For these criticalities energy mapping is today still poorly understood and used in territorial tools.

In the Italian context, energy is mostly expressed in three abstract forms: quantitative representation, cartograms, and naive images ●.

Quantitative representations are the most common way to express energy in policy documents; they focus on quantitative data (kWh consumption, MW production, number of plants, etc.) expressed in graphs, diagrams,

and tables. The main nature of their information is statistical, a language related to economic and technological disciplines more than territorial. These representations, while communicating fundamental data, fail in any spatialization operation by missing the relationship with spatial attributes.

Cartograms communicate quantitative data too, in aggregate form within geographical boundaries defined by administrative units such as regions and municipalities. These representations define a link with territorial authorities, rather than with the territory, conceiving the latter as merely statistical support. The form of representation then distributes information indiscriminately within administrative boundaries (political and not physical), providing general information unable to grasp the various and minute spatial differences.

The last form of representation only naively approaches spatial issues. These images idealise some energy models, abstracting them from a real context and tend to represent a certain model in a basic and standardised spatial context, therefore devoid of connotations. The aim is to suggest and stimulate a certain vision or idea of transition, but the abstraction and banalized spatial connotations often limit the application in real contexts.

6·3 EXPERIMENTAL MAPS FOR THE VENETO ENERGY TRANSITION

The considerations above raise an interesting challenge for urban planning as well as a new panorama of experimentation for urban planners: there are no inventions of a research object without innovative cartographic explorations (Viganò, 2018). Many of the considerations made in the research work have emerged within mapping operations, in which outputs were collected in a 'spatialized atlas of the energy transition' focusing on the specific territorial case of the Veneto region ④. All the operations required a rigorous, but also creative approach, which led to the definition of some useful elements to set a grammar of spatialized representation of the energy transition.

Because of the richness of the results, it is not possible to report the entire mapping operation here, but some reflections and procedures deserve attention. The Atlas has been structured according to the main parts of an energy system: consumption, transportation, and production from fossil and renewable resources. Among these parts, renewable production required a consistent analysis: the lack of spatial data forced a complex spatialization (geocoding) of quantitative data on the location, power, and resources of each plant. The dataset obtained then allowed many layering operations with territorial systems at different scales that produced interesting reflections, some of which, by way of example, will be presented below.

Through the territorialisation of renewable production systems on a regional scale in Figure 1, it has been possible to observe a particular spatial phenomenon: the 'energy sprawl'. The possibility of producing energy in a widespread way, combined with generous economic incentives and the liberalisation of the energy market, led, in a short time, to the construction of many small and medium-sized plants throughout the territory.

In the past, energy was generated in isolated places and generally located in suburban or marginal areas ●. Now the production has been pulverised in small infrastructures spread in many contexts. The various combinations of technologies and sources produce very diverse spatial outcomes: new physical objects such as wind turbines, solar panels, domes of biogas plants, as well as new spatial configurations such as agro-energy crops or Short Rotation Forestry systems, constitute a high variety of new energy landscapes.

The design of these spaces depends on the nature of the stakeholders behind them: the new way to produce energy caused a pulverisation also of the energy actors, some attracted by economic incentives producing speculative transformation, some seizing new opportunities carrying on innovative practices such as energy communities.

De-layering the specific productions by resources, and observing them at different scales, brought out other interesting spatial aspects.

The distribution of photovoltaic production is distinguished by the type of plant. The central Veneto plain, place of the 'città diffusa' urban system, features more plants integrated into buildings, while in the lower plain (Polesine and Bassa Pianura Veronese) more utility-scale plants can be found.

Representing these systems closely, one notices how in the first area the many photovoltaic systems are on the roofs of the production buildings in Figure 2, creating a new spatial element that we could call 'capannone fotovoltaico'. Here, the urban sprawl and the spread of medium and small production buildings seem to offer optimal support for the installation of photovoltaic plants, becoming part of the energy resource.

Opposite effects, instead, are produced by the distribution on the lower plain by utility-scale plants, often very large and falling in marginal agro-industrial contexts with low profitability agriculture ●. Looking closely, also thanks to fieldwork, one notices how the photovoltaic panels fall on the countryside with heavy infrastructures that generate land consumption and, especially because of a rigid system of fences, exclude large parts of the territory from the inhabitants' accessibility and interrupt ecological networks.

Moving on to hydroelectric production, one can observe, alongside the historical infrastructures, the spread of many 'mini' plants. These installations are located both in the mountain and in the high plain contexts.

In the Alps, these plants fall on rivers often characterised by fragile, but important ecosystems. The technology used is the basin system, which involves the subtraction of water flow for long stretches of river, with wide effects on the environment.

In the high plain, however, the plants often fall on existing hydraulic infrastructure [fig. 3] such as irrigation canals, water mills and old factories. In this territorial combination, we can appreciate the enhancement of embedded energy, the recovery of historical artefacts and the consideration of the territorial palimpsest of energy.

Finally, observing the bioenergy production, both from solid biomass and biogas, it emerged that there is a strong spatial implication along the supply chain of resources. This production is based on the use of substrates derived from different sectors (forestry, industry, agriculture, urban) that

often are not close to the production site. This is the case of many industrial solid biomass plants based on an articulated supply chain system [fig. 4] which frequently involves the transport of wood even from very distant places, thus creating imbalances between the use of renewable sources to reduce the emission of greenhouse gases and the transport of the same resources by trucks for long distances.

In the case of biogas, it emerges that there are territories particularly involved in this production. Initially designed to use agricultural and agro-industrial waste (zootechnical effluents, waste of food processing, pruning remains, etc.), today biogas is increasingly based on the consumption of dedicated crops. In some contexts, it emerges how extensive energy crops generate land-use competitive situations between agricultural and energy production [fig. 5].

These considerations, part of a much more extensive cartographic work, are useful to frame the pervasiveness of the spatial issues of the energy transition and, at the same time, of the many critical aspects raised by a lack of knowledge and territorial representation of energy transition.

6·4 THE NEED TO DESIGN THE ENERGY SPACE

The blindness of energy policies decoupled from a local territory, the lack of spatial knowledge, and the lower development of energy mapping in territorial tools have allowed an accidental re-territorialisation of the energy systems, producing critical outcomes in cascade effects. These criticalities led to the rise of territorial conflicts responsible for inertia in the development of renewables. To fix this situation, the legislation of several Italian territorial authorities has become more stringent, by carrying out an approach based on constraint, both in planning and in plant authorization. These new policies therefore only define where it is not possible to install a plant and, at most, how to visually mitigate it in the landscape, trivialising the spatial issue to a mere aesthetic aspect (Ferrario, Puttlli and D'Angelo, 2022). The main design and planning tool is the definition of 'suitable' and 'non-suitable areas' ●, a zoning approach unable to say how energy space should be designed and built. The space of the energy transition is thus conceived in residual terms, considered a 'technical support' or a 'site to be developed' where the resource and the space must be configured for maximum technical and economic efficiency, spreading many isomorphic projects (same solutions for different contexts).

The energy transition and the new 'spatialities' that it entails (energy sprawl, high variety of landscapes, soil consumption) force a deep rethinking of space and its design. In this sense, cartography is perhaps the first act to approach a new design culture of transition. Thanks to the layering operations it is possible to grasp the spatial and territorial potential that could become an opportunity for interesting projects. Mapping can provide a useful grammar for spatial composition. Only in this way can the energy space be opened and allow for shared uses through multifunctional configurations (e.g., agro-voltaic systems), relate to what already exists in the context (e.g., the recovery of old factories for hydroelectric production),

and customise and enhance spaces and resources present in a context (e.g., biogas plants on zootechnical farms).

These new perspectives on energy space could lead to a different transition, designing spaces and infrastructures for shared use and by the different instances of the actors of a territory.

The mapping operation seems to acquire a fundamental role in regaining spatial control over the process and territorializing energy systems for a more desirable, just, and sustainable energy transition, moving from a technological and eco-modern vision to a more socio-ecological perspective.

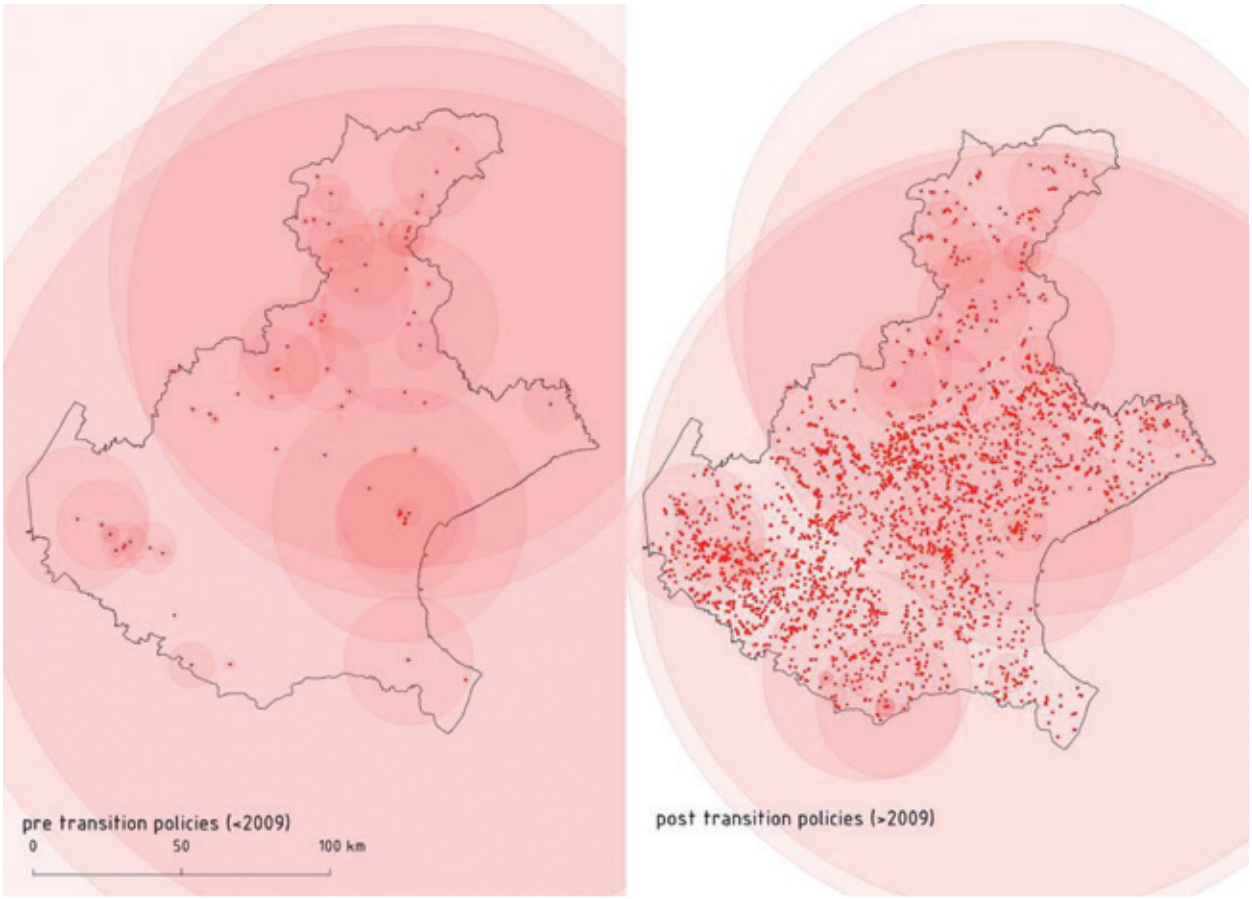


fig. 1. Energy transition in Veneto region, before and since the launch of the Community energy policies in 2009. The effects of energy sprawl are evident: from a few punctual spaces to the pulverisation of energy infrastructures. Credits: elaborated by Fabrizio D'Angelo.

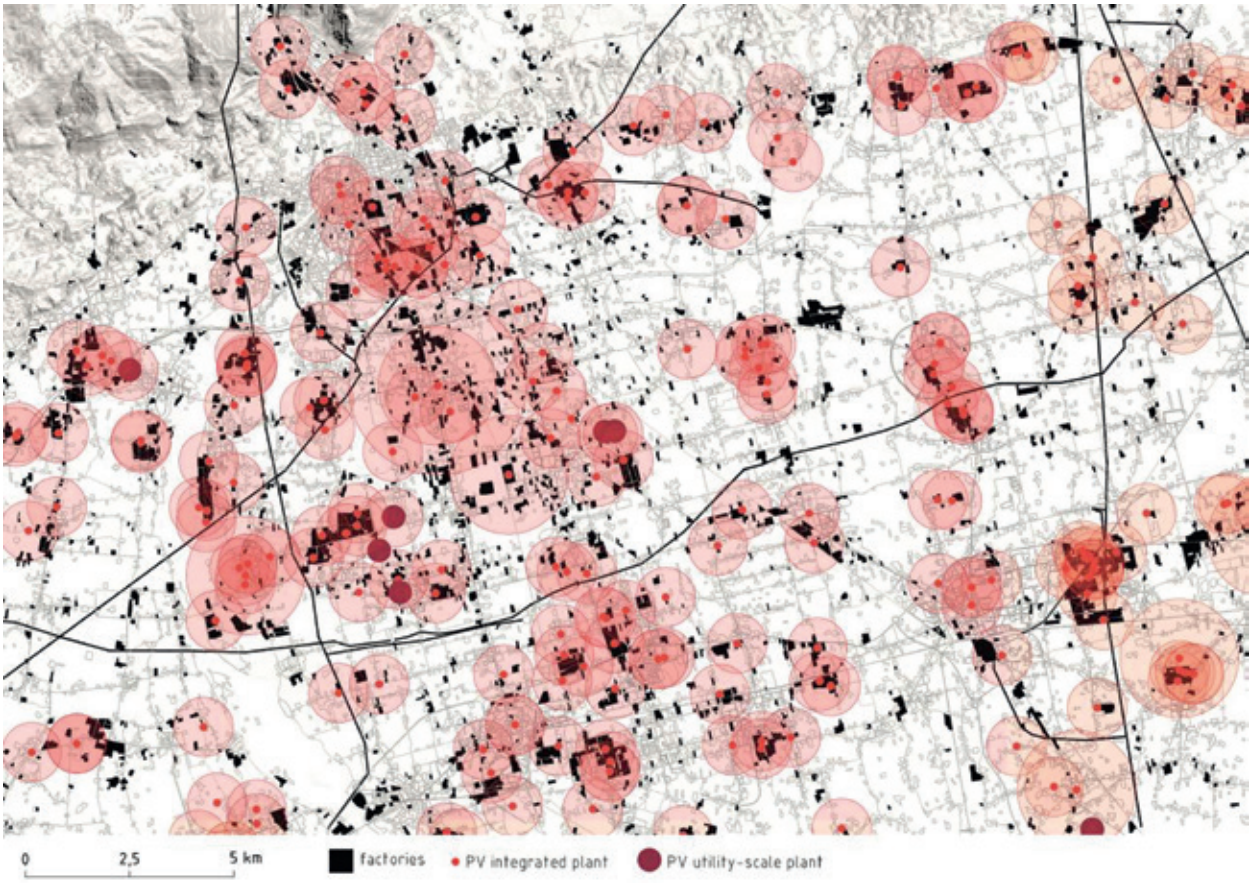


fig. 2. The 'capannone fotovoltaico' territorial system. The largest part of photovoltaic plants is installed on the roofs of the spread system of small and medium factories. The diffuse and consistent presence of these kinds of roofs, flat and large, facilitates the installation of such infrastructures. Credits: elaborated by Fabrizio D'Angelo.

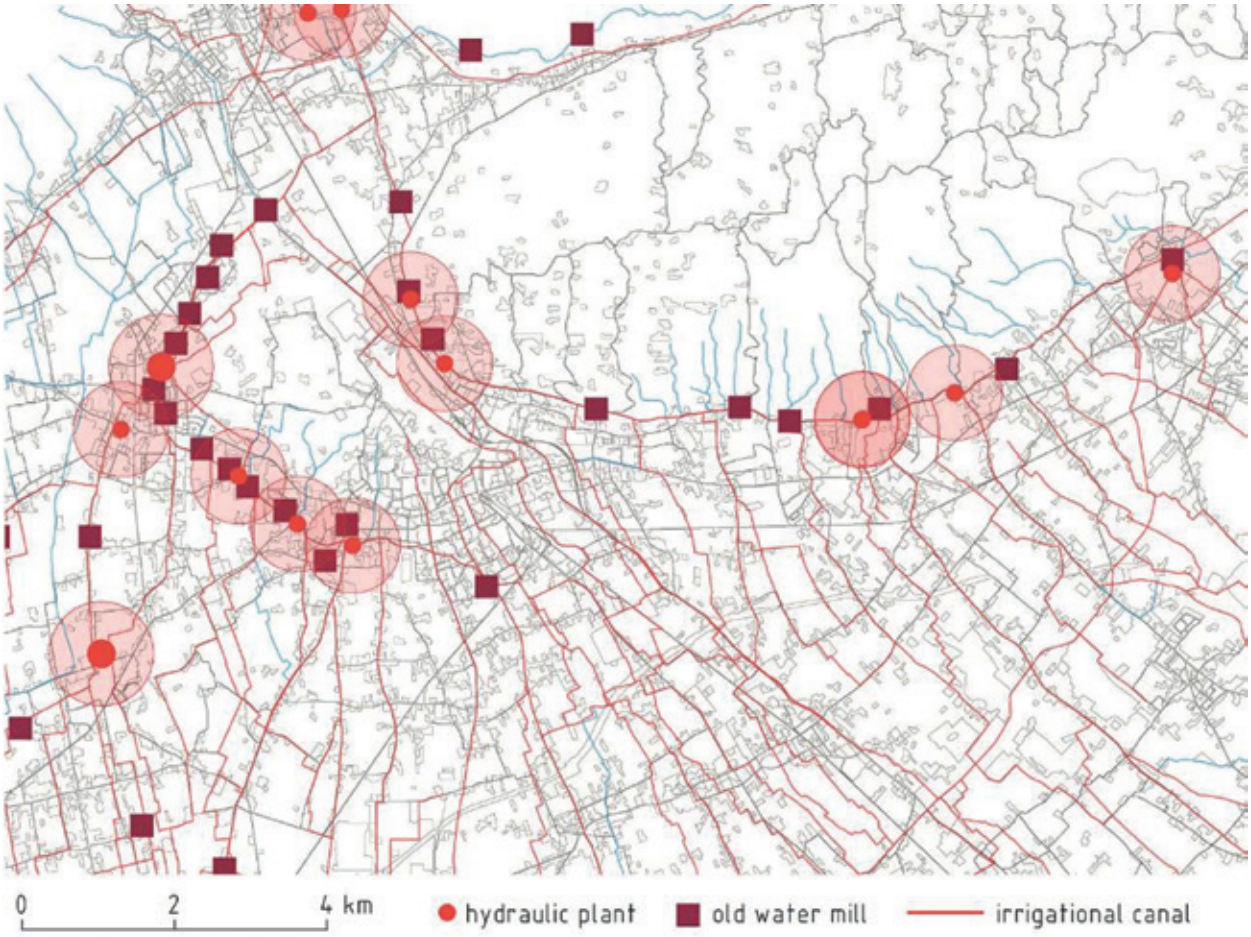
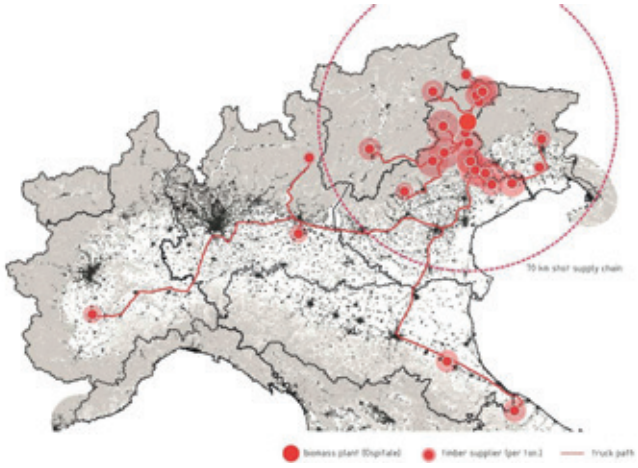


fig. 3. The 'mini' hydroelectric production in the high plain (Montello). The plants are built on old hydraulic factories and water mills, and along the irrigation canals. These operations enhance the embedded energy and relate to the territorial palimpsest of energy. Credits: elaborated by Fabrizio D'Angelo.



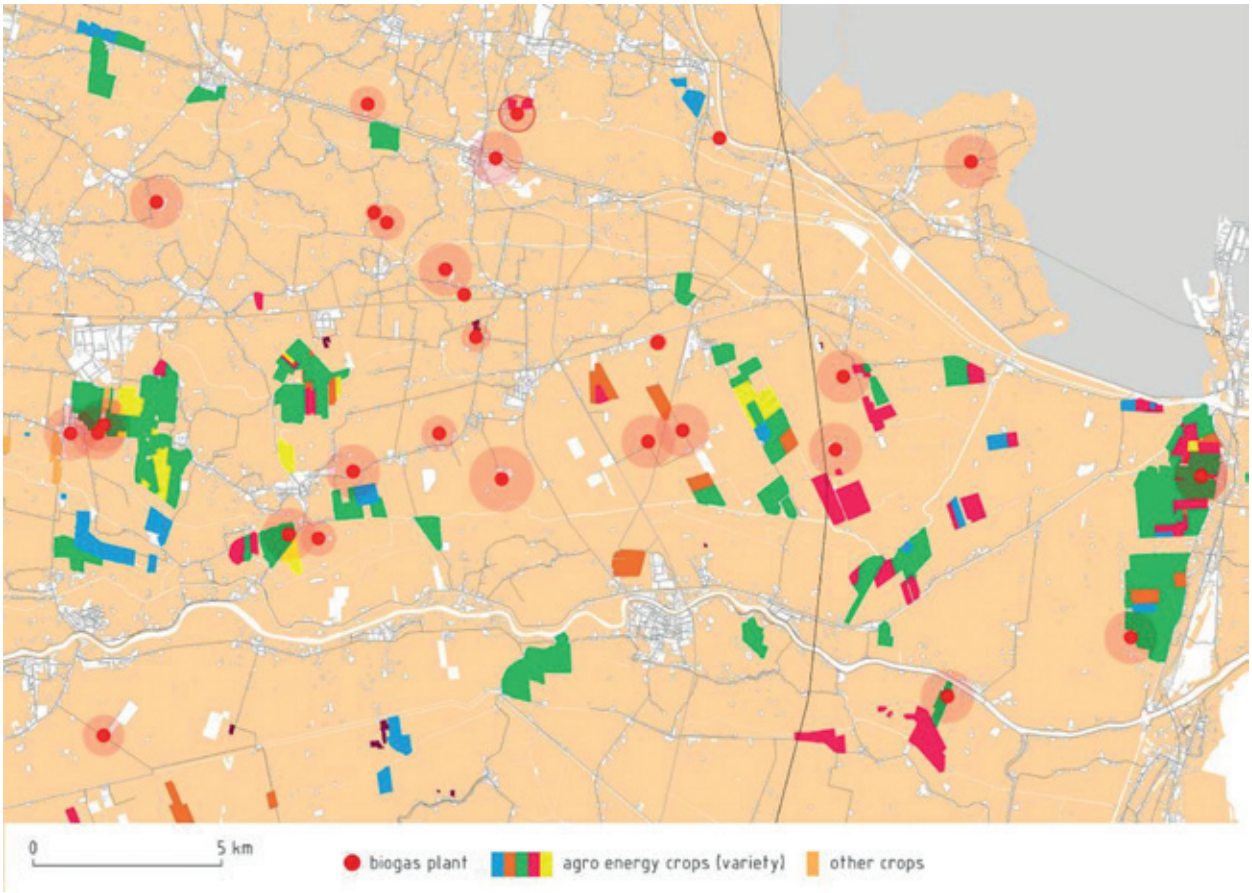


fig. 4. The supply chain of the Ospitale di Cadore biomass plant (the most powerful one in Veneto). The paths of truck transportation and the circle of the short supply chain, as defined by law, suggest the maximum distance for sustainable energy production. Credits: elaborated by Fabrizio D'Angelo.

fig. 5. The 'biogas valley', a territory particularly dedicated to this energy production. It features a variety of agro-energy crops used to produce biomass, as well as a high concentration of biogas plants. Credits: elaborated by Fabrizio D'Angelo.

ENDNOTES

①: Terna, Report produzione elettrica, 2009, 2013.
●: GSE, Report Rinnovabili 2009, 2013, 2021.
●: These considerations are the result of a survey, carried out in the research work, to return the iconographic trends related to the energy transition. This work was done by investigating the iconographic apparatus in the main tools of energy planning at the national scale, at the scale of some regional contexts, and then at the local scale, looking to the Municipal Energy Plans-PEC of big Italian cities, and to the Action Plans for Climate and Energy-PAESC of many municipalities in Veneto. Other images were detected in the territorial and landscape planning at regional scale, and from documents, reports, scientific studies met in the research path.
④: The mapping operations used the Veneto region as a laboratory, both for the interesting energy perspective (the Veneto energy system is the most affected by the energy policies in the Italian context, moving from a system of important fossil production to one of the most active contexts in the spread of renewable production) and because, being the transition expressed by energy policies and planning tools, it was necessary identify an administratively delineated territory.
●: The main production sites in Veneto were located along the coast with the thermal plant (Porto Marghera, Porto Tolle) and in the mountain area with a complex hydroelectric system (river Piave Basin).
●: In these areas, a low population density, a less profitable agriculture, and a scarce territorial representation allow more speculative energy interventions with critical effects. To more information refer to the paper, result of the same research, Transizione energetica: dal conflitto territoriale al progetto spaziale (2022).
●: The non-suitable areas, or 'Aree non idonee', have been introduced with the DM 10.09.10 'Linee guida per l'autorizzazione degli impianti alimentati da fonti rinnovabili'. The Decree invites the Regional Authorities to define, according to specific criteria, the areas not suitable for the installation of renewable plants. This definition is based also on the landscape, environmental and territorial planning. More recently (starting from 2022), the same authorities have introduced, with a similar approach, the notion of suitable areas, or 'Aree idonee', which are the spaces where the installation of a plant is less impactful.

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7 RE-WRITING THE CITY: CENTRAL VALLEY OF CHILE

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The paper presents the phenomenon of re-writing the city in the Central Valley of Chile, an ongoing investigation about how the re-writing of the city.

This way of urban production predominant in European and North American cities from various actions, practices and projects composed by the prefix ‘re’ – which have in common the vocation to build the urban future from processes of repairing itself as a generic principle – is taking place in the Chilean Central Valley, a relatively poor agricultural region located in a developing and highly centralised country, where regulations and the availability of space to build promote urban sprawl. Moreover, the Chilean Central Valley is a particularly interesting area for its morphology, which is constantly, randomly and drastically altered by intense seismic events, which in turn generate and accelerate the conditions for a constant re-writing of its cities. The paper is written from the point of view of a researcher who, having known and explored practices and theories of a European matrix, allows himself, due to a double biographical culture, to de-centre his gaze and investigate the phenomenon in the global south from a unique perspective which enables him to translate, interpret and observe phenomena characteristic of the re-writing from the global north in the territory under study, the Chilean Central Valley.

7·1 ON RE-WRITING THE CITY: THE CENTRAL VALLEY OF CHILE

«Buildings, urban areas and open spaces are subject to cycles of high and low utilisation, during which there are moments of transition, uncertainty and immobility» (Inti et al., 2014). Natural disasters, economic factors, and political changes, among others, often lead part of the built environment in qualitative and quantitative decline into a temporary gap of uncertainty between its old and new use.

This phenomenon has led the different stakeholders, both public and private, to rethink and put these types of places back into the built environment by generating a re-writing of the city and the territory based on processes of repairing itself. This generic principle (Paquette, 2020) encompasses various actions, practices and projects composed of the prefix 're' with a clear aptitude 'to return to', such as reconstruction, recycling, revitalization, etc. Amongst these concepts, 'urban regeneration' – a term which emerged in the 1980's and 1990's to describe and understand processes of reactivation of disused urban sectors (Leary and McCarthy, 2013) – is the one that best embodies this framework today (Nicoletto, 2023).

This family of concepts, despite their differences and various entry points, have in common, consciously or intuitively, the intention of building the future from new strata by «reusing previous structures and traces, whatever they may be» (Genette, 1982) based on a re-writing that reactivates and initiates new cycles within the palimpsest and «where transformative action is above all a critical act that confronts the existing» (Viganò, 2021). This way of urban production has prevailed in European and North American cities for several decades, mainly in terms of urban contraction processes. However, by decentring the gaze, Latin America appears as a region that has valuable experiences in this area, which are found under other modalities capable of positioning themselves locally in relation to the global phenomenon from contexts that are still in urban expansion [fig. 1].

7·2 CENTRAL VALLEY OF CHILE

Under this premise, this article presents how this re-writing of the city is taking place in the Central Valley of Chile, a geographical region «defined by the Angostura de Paine and the Diguillin River in a north-south direction and by the Andes Mountains and the Costa Mountains in an east-west direction» (Roman, 2013). This area, with almost two million inhabitants and a surface of 350 km2, is presented as an agricultural territory par excellence, «a hidden treasure for agriculture» (MVRDV, 2005). This is due to its Mediterranean climate and the large amount of water resources coming from the Andes which subdivide the area internally into five minor valleys which are very similar, and which together form this plain.

This territory is made up of nine medium sized cities, more or less equidistant from each other [fig. 2] which range between 30,000 and 200,000 inhabitants. These settlements form the social and administrative centres of the area and attract daily migrants from the surrounding towns and

villages «to satisfy tertiary, study, and trade activities» (Olave, 2005). These cities originated from the extension of the Camino Real de la Frontera route (Sanhueza, 2018) in the «foundational process that between 1695 and 1800 connected the capital Santiago with Concepción» (Lorenzo, 2013) which, suffered a «late and explosive urbanisation process since the end of the 19th century due to the concentration of population in their urban areas» (García-Huidobro and Montoya, 2017) and the proliferation of small satellite settlements. Due to the prevailing neoliberal economic logics implemented in the area since the early 1980's – «where most of the urban components are objects of business and speculation» (Rodríguez and Rodríguez, 2009), urban regulations «which do not propose a significant counterweight that can dispute the mercantilist notion in decision-making approaches» (Rodríguez and Rodríguez, 2009) and the availability of buildable space «constantly exceed their limits producing a disorderly and uncontrolled urban sprawl towards the peripheries» (Brueckner, 2001), generated an increasingly urbanised territory.

The valley, rather than a plain with small and medium-sized settlements, can instead be defined as «a city in the territory connected by road and railway line, […] a Central Valley City, as identifiable in a satellite image» (Roman, 2013). A valley in which productive agriculture coexists with the built environment and forms a way of life outside of classic binarism, «where the traditional division between city and countryside has been destroyed» (Amin and Thrift, 2002), allowing a permeable inhabitation between both realities, characterised by constant displacements and diverse rhythms. This territory is particularly interesting in terms of re-writing as it constantly, but randomly, sees its morphology drastically altered due to intense seismic events [fig. 3] which generate and accelerate the conditions for a constant re-writing of the city.

It is from this territory that this current research, after a holistic review of the inevitable specificities of the area (Brenner, 2013) translates and interprets recurrent elements of how re-writing takes place in the global north to account for the diverse re-writing practices that are carried out spatially through projects built in the Central Valley of Chile.

7·3 THE WAYS TO RE-WRITE THE CITY IN THE CENTRAL VALLEY OF CHILE

The Central Valley of Chile is an area which does not have large urban recycling projects. Indeed, urban regeneration based on processes of self-repair as «urban action no longer oriented to growth but to the rethinking and reuse of spaces and territorial resources» (Campagnari and Ranzini, 2022) is not particularly developed «despite the existence of a high potential of land – and spaces – that can be recycled» (Paquette, 2020). Historically, one can rather observe top-down state processes of both heritage restoration and reconstruction – public and private – after earthquakes and more recently public programmes of urban-housing regeneration which during the last decade have focused on the quantitative deficit – mainly in neighbourhoods – of the already built city (Bustos-Peñafiel, 2019) in order to comply with international agendas such as the Sustainable

Development Goals and the New Urban Agenda on Habitat: III of the UN to which the state adheres (FAU, 2022).

In this context, where re-writing develops from these focused governmental actions, the research has identified in the area two unprecedented re-writing practices in the world, generated from the intuition and the common sense that precariousness offers, which, outside of any state initiative and in a spontaneous manner, have been able to emerge and replicate themselves in the Central Valley [fig. 4].

Intuitive re-writing practices (Bustos-Peñafiel, 2019) which clearly and immediately perceive «the possibilities that a second life offers the territory» (Miño, 2022), emerged after the 2010 earthquake in the area. They quickly, without large budgets and using legal loopholes to their advantage, are «generating new forms of appropriation, belonging and citizenship» (Campagnari and Ranzini, 2022), based on «practices which reason in terms of 'how best we can' based on existing conditions and not on 'best possible' in absolute terms» (Centemeri, 2019).

Can these two unprecedented and unexplored approaches from which this contribution proposes and explores how is the specific intuitive re-writing – carried out spatially – in the central valley of Chile from its lights and shadows, contribute to the debate with a new and useful angle to both the local and global scenario of the subject?

7·4 UNPRECEDENTED BOTTOM-UP MODALITIES OF THE CENTRAL VALLEY OF CHILE: TWO SHORT REVIEWS.

7·4·1 Family Re.Talca: School of architecture of the university of Talca

In 1999 the School of Architecture of the University of Talca was founded in the centre of this valley, which in addition to defining the Central Valley of Chile as the basis of its work and «generating a strong link with the economic and social reality of the region» (Uribe, 2011) proposed as the main educational innovation an unprecedented reinterpretation of the third mission based on final degree projects built by its students «based on an practice which operates locally and values the cultural identity of the inhabitants» which «in addition to generating a transfer of knowledge from the university to society, presents a transfer of knowledge from society to the university» (Román, 2013) through small projects of territorial acupuncture which are the result of a fine analysis of the fabric in which they are strategically implanted.

Thus, amid a landscape in continuous evolution because of agricultural exploitation and urban development, around 500 works have been carried out by young architects, who are open to exploring new possibilities and spatial forms based on the premise of «with what is available as an opportunity» (Valenzuela, 2021). Together with local communities, they have conceived, designed, managed, attracted funding, and created small architectures thanks to cooperation, alliances, and unprecedented permits, where informality is often a precise resource to be exploited.

Although this practice which has been operational since 2004, at first sight, appears to be a heterogeneous set of projects, it has begun to

produce several families of projects which share the same way of positioning themselves in this territory. Among them, the one called Re.Talca [fig. 5] is particularly interesting for the research, which refers to processes of transformation and collective care of both urban and rural spaces which, once a life cycle has ended, have begun to be reactivated in an uninterrupted manner. After the 2010 earthquake, a series of low-budget and highly expressive built works stemming from proactive bottom-up approaches and community involvement have begun to re-write this territory based on local and specific welfare services which are difficult to identify or confront on the part of the institutions [fig. 6].

7 · 4 · 2 27F Parking lots

The persistent need to travel between small and medium-sized cities in the interior of the valley generated a logarithmic growth in the number of automobiles in the last twenty years (Maturana et al., 2022), as the population with greater purchasing power and the possibility of obtaining loans «took advantage of free trade agreements, the fall in tariffs and the boom in the Asian market in vehicle production» (Maturana et al., 2022) to acquire, in many cases as a first investment, their own car. This phenomenon has introduced an unprecedented number of vehicles into these cities since the beginning of the 21st century.

It was right in the middle of this automotive boom that the 27F earthquake of 2010 hit the area, which, thanks to the seismic culture of construction (Norma chilena oficial, 1972), «mainly damaged old adobe buildings which had not suffered major damage in previous earthquakes" (CEPAL, 2010). To quickly overcome the initial state of emergency, the various municipalities in the area focused their actions on the total or partial demolition of all those structures which put people's safety at risk, starting with the issuing of unprecedented demolition decrees from the mayor's office (Ley 18.695, 1998) which, unintentionally, caused a notorious deterioration of the central areas of the main cities in the Valley due to the rise of intra-urban voids [fig. 7].

This mix of circumstances resulted in a series of unforeseen regulatory consequences for the owners of these new empty spaces, since their land, having no buildings on it, was legally considered vacant urbanised land, obliging them to build perimeter fences or pay fines for not doing so (Ley general de Urbanismo y Construcciones, 1975) and doubling their taxes due to their strategic but empty location (Servicio de impuestos internos, 2005).

These unexpected economic sanctions made local creativity flourish, as some owners quickly realised that the acquired condition could be evaded by carrying out a minimal construction, which, in compliance with the regulations in force, was capable of legally returning the land to the status of built-up urban land.

With this knowledge and awareness of the high demand for parking spaces in the central areas of these cities, enterprising owners of these types of plots of land have started to re-put into operation these spaces since the end of 2010 by applying to the respective building authorities – in this case the municipality – for building permits for the construction of minimum spaces in conjunction with the change of land use to parking, thus giving shape to the 27/F Parking lots, which from a bottom-up

variant strongly influenced by the supply and demand logic seek to obtain a good return on land from a minimum investment on the basis of a growing demand.

So far, around 150 27/F Parking lots [fig. 8] have been built in the Chilean Central Valley, mostly located in Rancagua, Curico, and Talca, the cities most affected by the earthquake and those with the highest annual growth in car ownership. They stand out for their precarious formal materialisation in their enclosures, roofs, and floors, often presenting themselves as simple containers incapable of dialoguing with the historic centres in which they are inserted [fig. 9].

7·5 CONSIDERATIONS

The review on how the re-writing of the city is taking place within the Chilean Central Valley in these two intuitive ways leads to three final reflections:

7·5·1 Intuitive re-write

The value of these practices lies in presenting them as 'out-of-the-box' ways of re-writing, intuitively perceiving that «the wealth of a territory comes from its ability to renew itself by activating its own unused spaces in order to become its challenges and resources» (Balbo, 2015) even from contexts that are still far from the processes of urban contraction of the global north.

In addition to using legal loopholes and informality as an inevitable resource, these practices contain components of what in Europe has been called bottom-up urban regeneration. This concept refers to «processes which combine spatial transformation with activities of cultural production and function, as well as the provision of local welfare services» (Campagnari and Ranzini, 2022 based on processes elaborated from self-managed, incremental, and experimental initiatives. Only here it appears as an urban, non-metropolitan (Green and Abrantes, 2018) bottom-up variant strongly influenced by the logic of the «neoliberal city» (Janoschka and Hidalgo, 2014) in which «most of the urban components are objects of business and speculation» (Rodriguez and Rodriguez, 2009). This bottom-up variant also operates using the existing institutions from a reinterpretation of the third mission which operates both in non-metropolitan urban areas, villages, and rural areas.

7·5·2 Two sides of the same coin

It is interesting to note how the same territory can produce two diverse practices of intuitive re-writing but with reciprocal learning possibilities. On the one hand, Re.Talca is able to reach a maximum of spatial sophistication and social profitability but has not been able to institutionalise itself outside the academic world. On the other hand, 27/F Parking lots, in a legal way, still «leaves in evidence a reductionist perspective of competitive urban improvement» (European Commission, 2010) unable – for the moment – to transcend its function and present itself as a catalyst of social profitability.

Considering this, understanding the relevance of these practices is an imperative, to sense how what is being investigated «is relevant and not simply the expression of the – difficult – circumstances and constraints which may have originated the modality» (Aravena, 2016). Indeed, resource scarcity – from the complexity of the resource as a complex whole (Sáez, 2021)– should not be synonymous with low standards but rather an innovative catalyst.

7 · 5 · 3 Institutional learning

While European theorists point out that «to be able to refer to urban regeneration we need an institutional learning process [...] which guarantees sustainability and durability» (Ostanel, 2019), it is necessary to understand in this particular context – in which informality is often a precise resource to exploit – how rigid or flexible this institution should be in order not to overly bureaucratise both the practices and the Institutional learning.

These three reflections show that observing re-writing seems to be more than simply understanding and applying global urban trends in the different territories. Indeed, this action must be complemented with a review of the site where these matters will be reinterpreted as they may already be found, only under other interesting practices. This can open the doors to complex fields of action from the investigative, normative, physical, and spatial points of view capable of showing and exporting new edges and original positions on the topic.

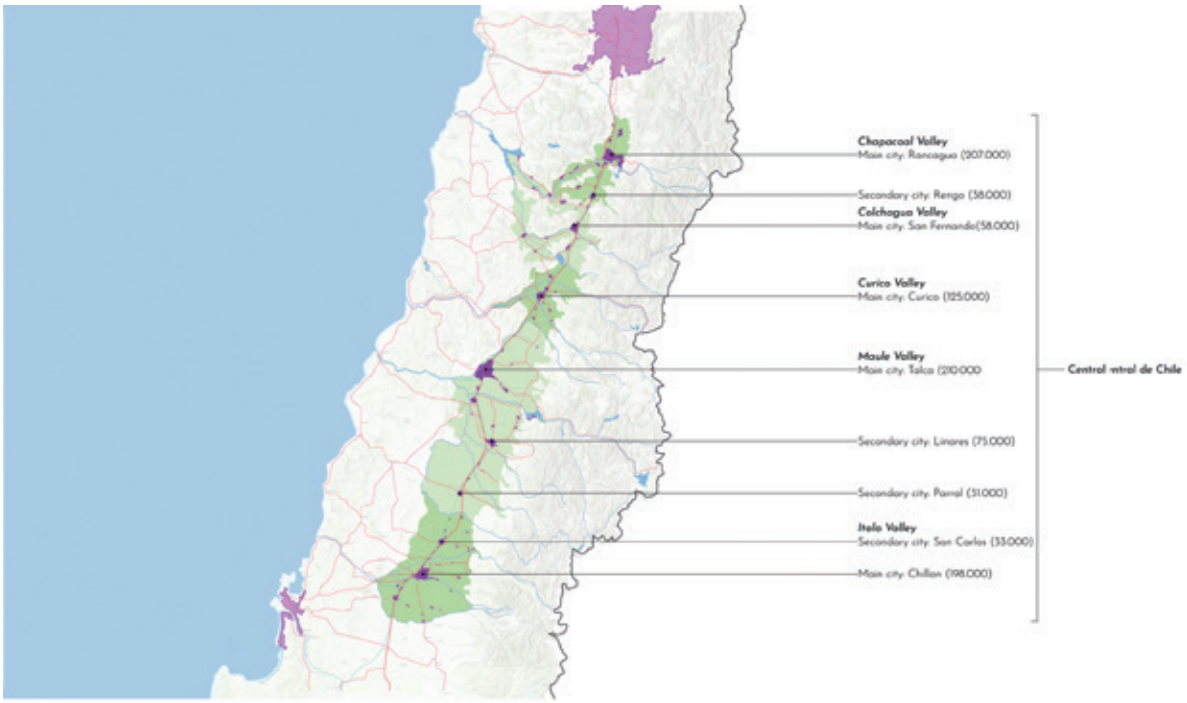
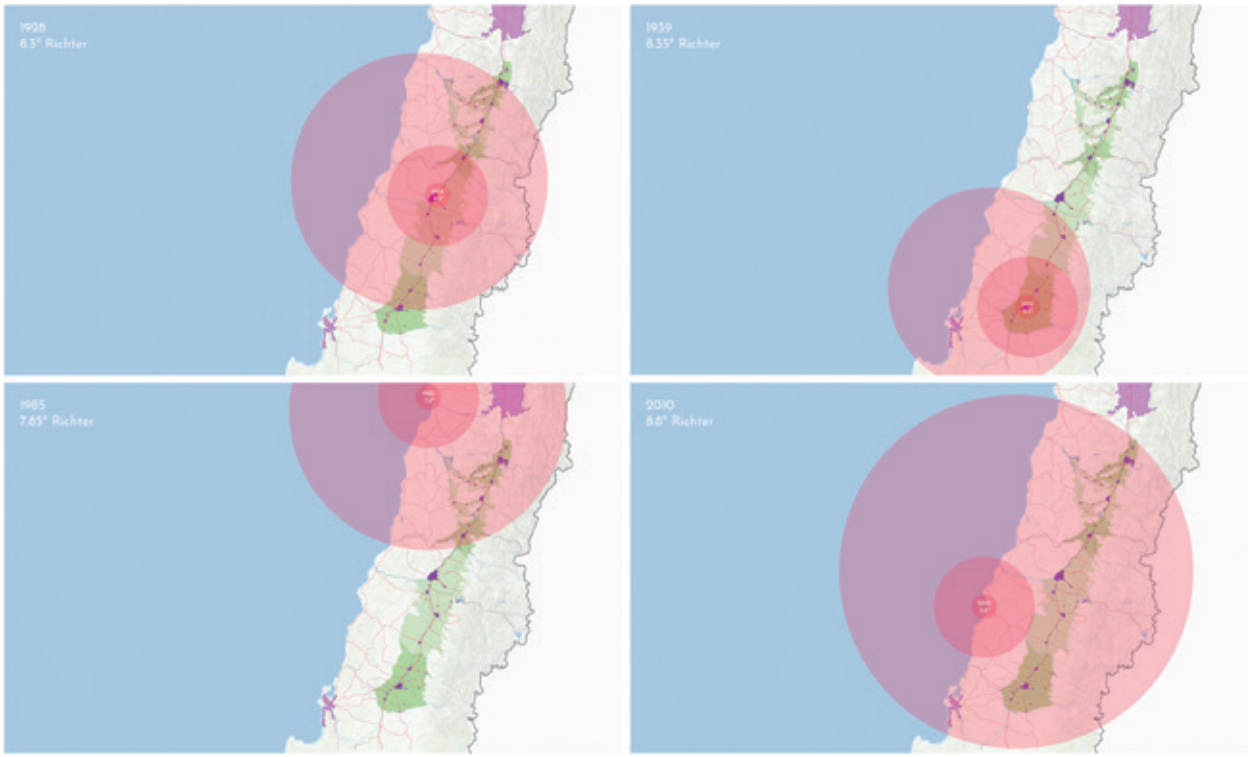


fig. 1. World and Central Valley of Chile. Credits: Screenshot from Google Earth.

fig. 2. Internal valleys and main cities of the Central Valley of Chile. Credits: elaborated by Felipe Miño.



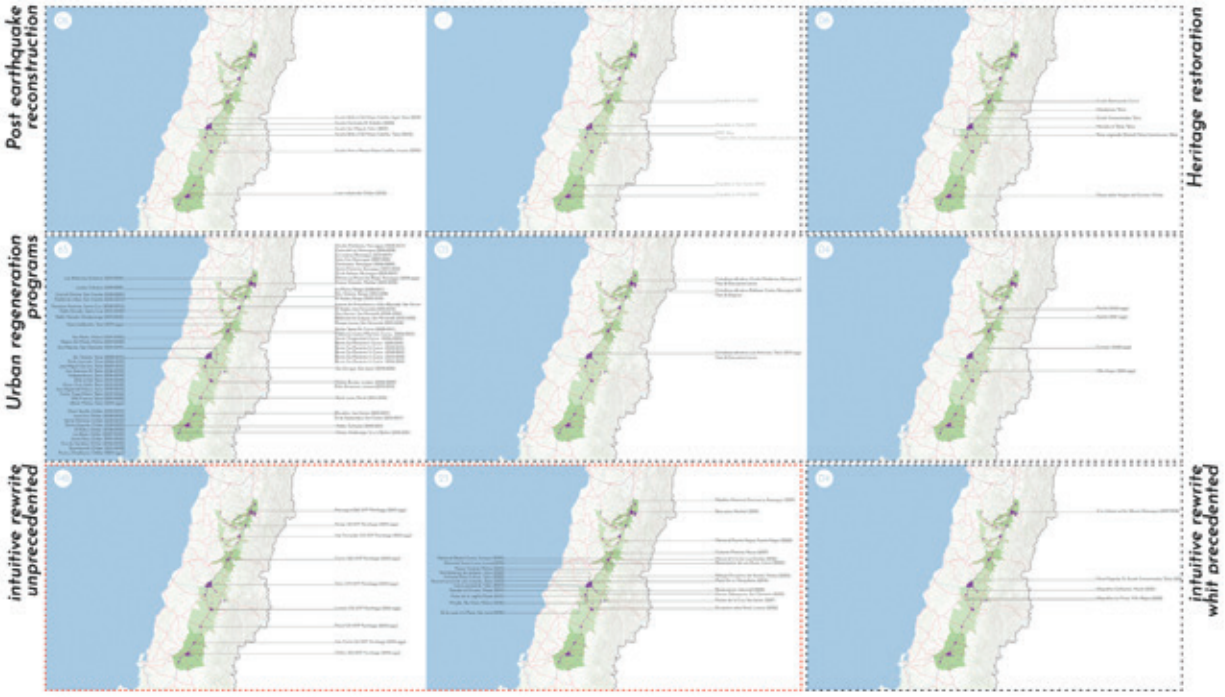


fig. 3. Earthquakes in the Central Valley of Chile, 1900-2022. Credits: elaborated by Felipe Miño.

fig. 4. Modalities of re-writing the city in the valley. Credits: elaborated by Felipe Miño.

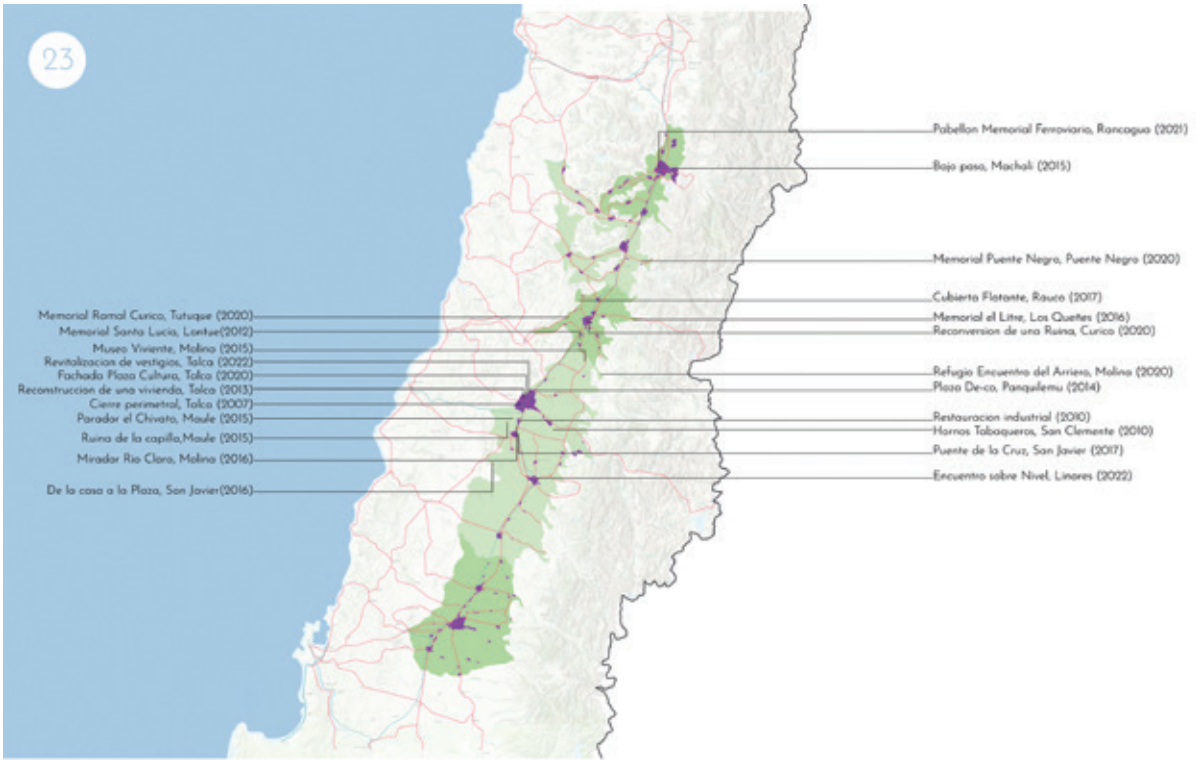


fig. 5. Mapping Re.Talca in the central valley of Chile, 2022. Credits: elaborated by Felipe Miño.

fig. 6. Some of the Re.Talca projects developed by students of the School of Architecture of the University of Talca in the Central Valley of Chile between 2010-2022. Credits: elaborated by the author.

fig. 7. Post-earthquake demolitions in the Central Valley of Chile 2010. Credits: Hector Labarca Rocco.

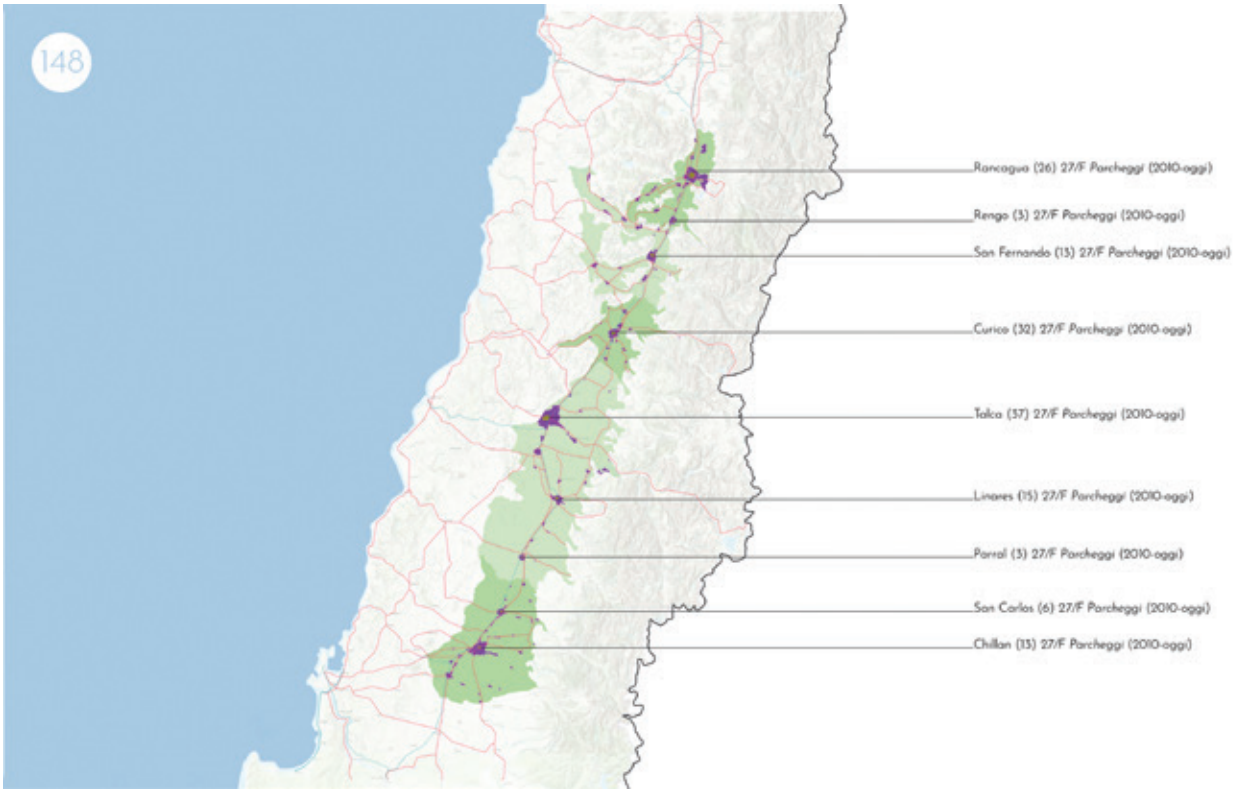


fig. 8. Mapping 27F Parking lots in the Central Valley of Chile, 2022. Credits: elaborated by Felipe Miño.

fig. 9. Some of the 27F Parking lots built in the Central Valley of Chile between 2010-2022. Credits: Edgard Torres.

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8 GREENING GREEN INFRASTRUCTURE: COMMUNITY LANDSCAPE AND ECOLOGICAL CONTINUITY IN THE METROPOLITAN CITY OF ROME

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The role of green infrastructure in the provision of diverse ecosystem services – meaning the benefits the human population obtains directly or indirectly from ecosystem functions – and particularly of the 'social and cultural' benefits related to identity, social, aesthetic, and recreational values, can be strategic in the transition of urban and peri-urban contexts to both socially and environmentally resilient areas.

The research investigates the concept of green infrastructure as a socio-ecological connection capable of reacting to climate change and ecological fragmentations while also creating 'community landscapes' through the delivery of a wide variety of ecosystem services. In this framework, the paper explores the social and cultural dimension of green infrastructure through an examination of academic publications, EU policies, and practices of community engagement acknowledging its significant role in the combination of environmental and social aspects.

8·1 INTRODUCTION

Cities have become the predominant living environments of human beings worldwide. According to the Renewables in Cities Global Status Report (2019), in 2050 around 70% of the world population will be concentrated in urban areas; cities are therefore not only one of the major causes of climate change, producing around 75% of carbon emissions, but also their first victims. In this socio-ecological crisis, intensified by the loss of biodiversity and socio-environmental injustice, the shaping of responsive cities is crucial for fostering healthy and regenerative urban societies as well as nature preservation (Salata et al., 2023). In recent years – in the era of ecological transition and climate neutrality – there has been an emerging interest in the agendas of the cities regarding the creation and valorisation of green infrastructure (GI). In particular, urban and peri-urban forestry is recognized as one of the tools that can allow cities to respond to the increasingly urgent request of fighting climate change within the city itself, providing diverse benefits to the population in terms of environmental, economic, and socio-cultural impacts (ecosystem services). In this direction goes the goal set by the Italian Government of planting 6.6 million trees by 2024 on 6,600 hectares with a budget of 330 million euros (National Recovery and Resilience Plan, n.d.). Moreover, a study conducted by AzzeroCO2 and Legambiente surveyed over 120 macro-projects in 2021 in Italy involving 585 hectares and the planting of 450 thousand trees, for a total investment of over 10 million euros. However, this rapidly evolving interest and action in urban and peri-urban afforestation requires a series of necessary considerations: it represents an opportunity but, at the same time, it spurs concerns not only related to environmental and ecological aspects (e.g., the use of native species) but also related to social and cultural dimension such as (i) localization, (ii) effective implementation and long-term management, (iii) social and cultural identity and justice, and (iv) community needs. According to the Scientific Outcome of the IPBES-IPCC Workshop on Biodiversity and Climate Change (2021), policies and practices that simultaneously address synergies between mitigating biodiversity loss and climate change, while also considering their impacts on communities, offer the opportunity to maximise co-benefits and help meet the objectives of sustainability.

Under this standpoint, the research 'Greening Green Infrastructure. Community Landscape and Ecological Continuity in the Metropolitan City of Rome' intends to investigate the concept of GI as a multifunctional and collaborative socio-ecological connection (Sandstrom, 2002; Davies et al., 2006), questioning the role of mapping and assessment of ecosystem services (ES) as a tool to support the integration of both the ecological/climate and the social/cultural dimensions of GI in the planning process of the Metropolitan City of Rome (CMRC). The first phase of the thematic examination is conducted through content analysis of academic publications and a grey literature review about GI, ES, and the methods and practices for their operation. In the second phase of active investigation, the mapping and assessment of ES will be used to examine and evaluate the CMRC environmental and climate measures and practices, with an in-depth study of urban and peri-urban afforestation. Finally, in the third phase, the research

intends to propose reflections and tools to investigate, drive, implement, and manage GI for environmentally and socially sensitive transformations of the CMRC, aimed at maximising the multifunctional and collaborative values of GI.

This paper is directed by three questions:

1. What are green infrastructure and ecosystem services?
2. Which are the aspects of the social/cultural dimension of GI considered by European environmental and climate policies?
3. How can community engagement practices in GI planning, funding, and management capture both the climate/ecological and social/cultural dimensions?

The author examines the initial results of the research and discusses its future steps and perspectives, suggesting some first reflections on the social and cultural dimension of GI and its relationship with community engagement practices.

8·2 GREEN INFRASTRUCTURE AND ECOSYSTEM SERVICES

GI, intended as socio-ecological connections with multifunctional value (Sandstrom, 2002; Davies et al., 2006), has overcome and enriched the concept of ecological networks, which is exclusively oriented towards the protection and conservation. GI makes the argument that the conservation, restoration, and maintenance of functioning natural systems not only protect ecosystem values and functions but also provide diverse social and economic benefits to people (Benedict and McMahon, 2002). The role of GI in the provision of ES – defined as the benefits of ecosystem functions derived from the human population directly or indirectly (Costanza et al., 1997), and precisely the benefits relating to identity, social, aesthetic, and recreational values – is particularly strategic in urban and peri-urban contexts where man-nature interplay is more complex, and the character of multifunctional socio-ecological connections does emerge more consistently. The Millennium Ecosystem Assessment (MEA, 2005) defines ES as the benefits that people obtain from ecosystems; they are contributions of ecosystem structure and function to human well-being and are classified into four categories: (i) provisioning (food, materials, and energy, which are directly used by people), (ii) regulating (e.g., of atmospheric gases, climate, water cycle), (iii) supporting (e.g., nutrient cycle, pollination, habitat, and hydrological cycles), and (iv) cultural. Specifically, MEA (2005) defines cultural ecosystem services (CES) as the non-material benefits people obtain from ecosystems through spiritual enrichment, cognitive development, reflection, recreation, and aesthetic experiences, including cultural diversity, spiritual values, knowledge systems, educational values, inspiration, aesthetic values, social relations, sense of place, cultural heritage values, recreation, and ecotourism. Although GI relations with urban planning have been the focus of numerous publications aiming to enhance ecological processes and to find practical solutions for building sustainable cities, the systematic investigation of their social and cultural dimension

is still an open subject. Therefore, if we consider CES as the expression of the social and cultural dimension of the GI, its acknowledgment can be a strategic tool to explore and drive the implementation of a more sensitive GI both environmentally and socially. Currently, the mapping and assessment of CES and their integration in the planning process remain relatively neglected and poorly recognized both in literature and in practice compared to other ES; this limitation could be explained, in part, by the peculiar characteristics of many CES, which are non-material, intangible, and invisible compared to other ES (Cheng et al., 2019). As outlined by Benedict and McMahon (2006), the role of the local community is crucial in the identification, design, management, and conservation of GI. MEA (2005) also states that the ES implicitly recognizes the importance of a socio-ecological systems approach, and that policy formulations should empower local people to participate in managing natural resources as part of a cultural landscape.

In this regard, the research draws on the conceptual framework developed by Church et al. (2014) and Fish et al. (2016), who both stated that environmental spaces enable a range of practices to take place, and these can, in turn, shape those spaces [fig. 1].

According to Church et al. (2014), both the spaces and practices enable people to gain a range of benefits, and these benefits can also further shape the spaces and practices that take place. For example, a study of conservation volunteering by O'Brien et al. (2010) outlines how benefiting from using and enjoying GI contributed to people's motivations for getting involved in practical conservation activity which led to stewardship of urban and peri-urban GI.

This framework provides a significant conceptual and methodological background for investigating the social and cultural dimension of GI considering community engagement as a social and cultural practice that enables cultural ecosystem benefits through the interaction with environmental spaces, shaping/creating 'community landscapes/spaces'.

8·3 THE SOCIAL AND CULTURAL DIMENSION OF URBAN AND PERI-URBAN GREEN INFRASTRUCTURE

8·3·1 The social and cultural dimension of GI in the EU environmental and climate policies for cities

The EU Green Infrastructure Strategy (2013) defines GI as a strategically planned network of natural and semi-natural areas with other environmental features designed and managed to deliver a wide range of ES. Starting from this definition, the European Union has indicated how the GI, Nature-based solutions (NBS), and SE supplied by them can offer innovative and sustainable solutions to the problems of the contemporary city, such as vulnerability due to climate change and soil consumption and advocates the full integration of GI into a wide range of policies. The EU Biodiversity Strategy for 2030 gives particular importance to GI in urban and peri-urban areas, inviting European cities of at least 20,000 inhabitants to develop urban greening plans, which include measures aimed at creating

forests, parks, and gardens. The EU Adaptation Strategy (2021) promotes the implementation of GI and NBS as multipurpose solutions that simultaneously provide environmental, social, and economic benefits and help building climate resilience to reach climate neutrality by 2050. The EU Forest Strategy 2030 (2021) promotes afforestation and tree planting in urban and peri-urban areas to reach the reduction of greenhouse gas emissions of at least 55% in 2030.

Despite the multifunctional role of GI being widely recognized, the four main European environmental and climate policies analysed tend to consider the social and cultural dimension of GI mainly as (i) Economic aspects (e.g., job opportunities, land, and property value), (ii) Awareness, education, and training, (iii) Physical and mental health (well-being), (iv) Connection between nature and humans, (v) Accessibility, (vi) Multilevel governance, (vii) Community involvement, (viii) Tourism, and (ix) Recreation ①.

It is possible to find a wider acknowledgment of the social and cultural dimension of GI in the New European Bauhaus (2021) and the Greening Cities Partnership of the EU Urban Agenda, which both recognize the role of green public areas as places capable of (i) creating quality urban spaces, (ii) enhancing social cohesion and equality (social interaction), (iii) increasing quality of life (liveability of the urban and peri-urban environment), and (iv) supporting community identity.

8 · 3 · 2 Practices of community engagement in GI planning, funding, and management

In line with the conceptual framework developed starting from Church et al. (2014) and Fish et al. (2016), the research collects and investigates community engagement practices (in the three phases of GI implementation: planning, funding, and management) that can convey both the ecological/climate and the social/cultural dimensions of GI.

The paragraph describes the initial results of a survey of community engagement practices activated in the framework of plans for GI implementation and innovative afforestation projects carried out by public initiative. A first analysis was carried out by examining documents and material available online; a further implementation of this study will be done by deepening the identified practices through interviews to improve the understanding of the role of these practices in the provision and maintenance of CES.

The first community engagement practice is the social and cultural activation of the community through intensive co-design workshops (called Junglathon LAB) involving municipal administration, citizens, associations, designers, enterprises, and students to share ideas for the implementation of the Prato Action Plan of the Urban Afforestation. The participatory tool is strategic to understand community needs and to create spaces capable of enabling cultural and social benefits (e.g., well-being, education, recreation, urban spaces quality, sustainable mobility) and at the same time to enhance social cohesion promoting confrontation among the community during the workshop itself.

The second practice is related to funding: the Forestami Fund managed by Comunità Milano Foundation on the initiative of the Municipality

of Milan that collects resources from citizens, companies, and institutions functional to the realisation of the afforestation project that aims at planting 3 million trees by 2030, fostering the ecological transition of the metropolitan city (Pastore et al., 2022). The collaborative funding tool is an innovative financing model capable of involving different stakeholders and creating community identity. However, this experience highlights a common criticality related to afforestation projects: the long-term management: in fact, during the summer of 2022 several trees died due to the drought probably amplified also by the lack of effective maintenance.

In this perspective, the third practice is actually a tool for the collaborative management of urban green spaces: the Pact of Collaboration promoted by the Strategic Plan of Green Infrastructure of the Municipality of Turin, an agreement through which one or more active citizens (or association) and a public entity (the Municipality of Turin) define the terms of collaboration for the care of tangible and intangible common goods (green urban and peri-urban areas). The Municipality of Turin has strongly invested in the involvement of associations and citizens in the management of public properties and 15 pacts have been signed by 2022 with the objective of 'care for public spaces and green areas'. The Collaboration Pact is a tool that can ensure shared care of the intervention, enhancing the possibility of sustainable maintenance besides the provision of a wide range of CES (e.g., green job opportunities, awareness, education, and training, recreation, community identity and sense of place, vitality and public space attractiveness, social interaction).

The last practice is 'Aula Verde', an environmental art installation created through a collective performance, realised by the artist Andreco, that ended with the planting of thirty trees placed in a circular structure to create a space for gathering and for teaching outdoors (Bronzi and Ciarleglio, 2022). The artistic practice acts with the aim of specifically creating a green space with the specific function of CES provision but, at the same time, its interaction with space delivered itself different CES (awareness and education, community identity, social cohesion, beauty of nature, connection between nature and humans).

8·4 CONCLUSIONS AND FUTURE PERSPECTIVES

This paper aims at illustrating that the social and cultural dimension of GI includes wide-ranging, diverse, and plural benefits that are less acknowledged than the ones related to the environmental dimension and that their recognition and evaluation through CES can be strategic for planners and policymakers. Moreover, as stressed by FAO (2016), engaging the community in the planning, design, and management of urban and peri-urban forests is crucial for ensuring effective implementation and inclusive governance. Community engagement, as a social and cultural practice, enables CES supply, shaping 'community landscapes' in their social and cultural dimension supporting objectives of sustainable development, environmental justice, social cohesion, and resilience (Hansen & Pauleit, 2014). Future steps of the research will investigate the social/cultural dimension of the CMRC environmental and climate strategies, with

an in-depth study of urban and peri-urban afforestation measures. The research will be guided by two main questions:

What is the current level of integration of the social and cultural dimension of GI into the environmental and climate practices in the CMRC?

What tools can the CMRC adopt to drive and implement its environmental and climate strategies to capture both the ecological and social-cultural dimensions of GI?

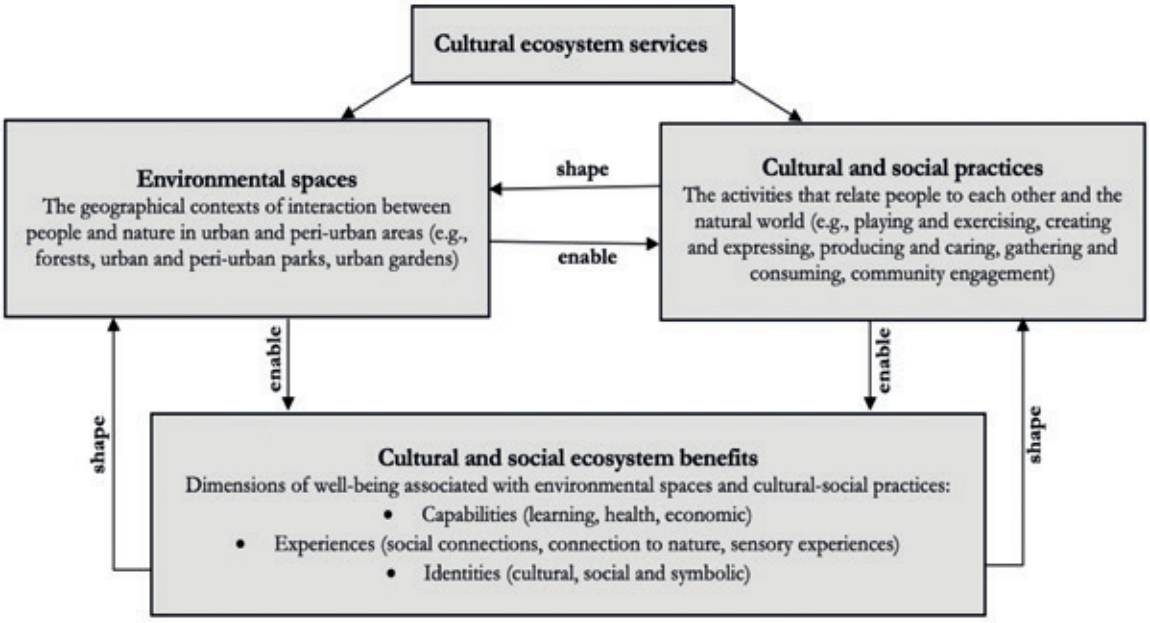

fig. 1. Conceptualization of CES as the interaction between environmental spaces and social or cultural practices that are conducted in these spaces. Credits: adapted by Carolina Pozzi from Fish et al., 2016.

fig. 2. Community engagement practices: 1. Junglathon LAB, 2. Forestami, 3. Pact of Collaboration, 4. 'Aula Verde'. Credits: Carolina Pozzi.

ENDNOTES

①:EU Green Infrastructure Strategy "Enhancing Europe's Natural Capital" (COM/2013/0249 final), EU Biodiversity Strategy for 2030 "Bringing nature back into our lives" (COM(2020) 380 final), EU Adaptation Strategy "Forging a climate-resilient Europe" (COM(2021) 82 final), EU Forest Strategy 2030 (COM(2021) 572 final).

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9 MAPPING THE SPACES OF AUTOMOBILITY IN THE CITYTERRITORY: TOWARDS A NEW TERRITORIAL PROJECT FOR THE TRANSITION

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The contemporary western European built environment revolves around the massive use of the car.

This dependency has produced the 'system of automobility', dictating social practices and crucially engendering a very characteristic type of space, constitutive of the contemporary 'city-territory'. The nefarious effects of this system are well documented, but the true scope of the spaces it occupies is mostly ignored in practice due to a lacunary imaginary and layered banalisation processes, both in popular culture and urban planning practices. This paper aims to explore the role of cartography in assessing and problematizing these spaces and their potential future transformation by showcasing two case studies. Each of these two examples, located in western Europe, will offer insights in quantifying the scope of the spaces linked to automobility, both in densely and diffusely built environments. Each set of maps aims to open the discussion towards challenges facing the city-territory in transition linked with a reassessment of this vast and mostly untapped resource: the spaces of automobility.

9·1 CONTEXT: AUTOMOBILITY AND THE CITY-TERRITORY

The massive use of the car is a practice which profoundly defines the structure of the contemporary western European built environment. At the heart of one of the great socio-technological cycle of the 20th century (Schumpeter, 1939; Hilbert, 2020), this single mode of transportation has enabled an unprecedented potential of social emancipation (Flonneau, 2008) and territorial intensification (Ross, 1999). Indeed, in a very short period, the car has enabled the advent of the 'system of automobility' (Urry, 2004), which conditions – some might say even dictates (Böhm et al., 2006)– social practices and crucially engenders a very characteristic type of space.

Automobility has also enabled the generalisation of a new, highly hybrid and fragmented territorial fabric, a complex web of interconnected urban, rural, and natural realms. Concepts such as the 'ville-territoire' (Corboz, 1990), 'città diffusa' (Indovina, 1990), 'Zwischenstadt' (Sieverts, 2004), or 'Rubber City' (Schaeffer and Sciear, 1975) were introduced in several parts of Europe to describe this urban condition, in which conventional imaginaries of 'urban' and 'rural' realms cannot be used anymore to accurately describe the paradoxical qualities of these territories ①.

Within this reality gravitating around the all-encompassing ethos of the automobile, it is not surprising that the spaces linked to the car and their numerous ancillary spaces (parking, driveways, etc.) amount to a formidable footprint, which can exceed 20% of the total ground surface in an agglomeration (Chester et al., 2015; 2022). This formidable land and grey energy resource, whose replacement value can be estimated in billions of dollars per agglomeration (Flonneau, 2003; Scharnhorst, 2018), is however often seen in a caricatural way, misunderstood as lacking any spatial qualities, as for example argued for by Augé (1992).

The nefarious ecological and social consequences of this system are well documented: CO2 emissions (EEA, 2019), soil sealing, fragmentation of natural habitats and landscapes (Qviström & Bengtsson, 2015), social marginalisation (Walks, 2015), or exacerbation of healthcare issues (Solnit, 2001). Even from a strictly economic standpoint, the system of automobility has reached its limit, where the congestion it produces outbalances the advantages it offers (Rigal, 2020), and spatial resources are very inefficiently used (Shoup, 2005). Thus, in keeping with the prerogatives of the transition, scenarios for a world 'after the car' (Dennis and Urry, 2009), or 'post car' (Cogato Lanza et al., 2021), where the automobile would lose its central presence, are being investigated in academia and percolate into discrete political actions.

Projects and policies underpinning this transformation can already be documented today. As a first example, the massive use of the automobile has indirectly led to the (re)discovery of the potential qualities of a public space (Paquot, 2009), which could be more than synonymous with road space. Thus, realms for richer, more flexible civic uses, walkable neighbourhoods, soft mobility, and space for mitigation of ecological damage (such as traffic restrictions, tree planting, water management, etc.) have appeared in contrast to theses spaces devoted to the car, forming limited perimeters around shopping zones in city centres, or in relation to new

high-density buildings along main axes of public transportation (Calthorpe, 1993; Ibraeva et al., 2020).

As a second example, on a policy level, the European Commission's 'No Net Land Take' directive (SEP, 2016), which calls for a halt of new soil sealing by the middle of the century, pursues a similar objective of winding down the expansionist capabilities offered by the system of automobility in urban planning. An area is considered 'taken' if a majority 5 by 5 hectare zone is occupied by sealed surfaces, or if a building parcel is considered built (Ruelle, 2020), leaving little in way of subtlety when describing the fine grain of diffuse urban fabrics which constitute, in terms of surface, the majority of the European city-territories (Build Europe, 2020).

In these two examples above, the limitations when confronting a 'post car' discourse● with the characteristics of the city territory are apparent: diffusely built areas are still defined as direct counterpoints to the traditional notion of urban centres, either caricatured as bucolic green countryside or trivialised as homogeneously artificialized and monofunctional suburban zones, hopelessly left to the clutches of automobility. Therefore, in the promotion of climate friendly mobility practices on a non-representative portion of the territory lies the risk of amplifying geographical disparities (Viganò et al., 2017). Indeed, a much-needed reflection adapted to the specific scale of the city-territory is necessary. Perhaps these spaces of automobility – which are today deemed peripheral, but amount to vast and continuous surfaces – can, if properly assessed, become an important resource for territorial transformations worthy of the challenges of the transition to occur.

9·2 HYPOTHESIS: MAPPING AS A TOOL FOR KNOWLEDGE PRODUCTION

This paper states the hypothesis that a better knowledge of the space of automobility through mapping can offer clues for designing an original spatial territorial project for the transition, starting with what is already there. What quantities are involved, what eco-systemic role can it play, and what are its typological characteristics?

Maps can offer an interpretative gaze of a portion of the territory, selecting elements as seen through a specific lens. The goal of the following maps is on the one hand to reveal the quantitative breadth of the mostly impermeable spaces linked the car, and on the other to qualitatively understand the different types of surfaces and social practices they support.

The following maps build upon publicly available geodata, historical analysis, on-site observations, and computational modelling to produce original cartographic material. Square samples of a typologically distinctive urban fabric were chosen as fragments of the western European city-territory representative of homogeneous ensembles, a built form and the infrastructural space it was built for. For each sample, quantitative data (the amount and categories of land cover materiality and usages) serves as a basis for comparison. The following chapter will highlight how this cartographic tool can serve as a base for hydrological simulation (in

Berlin-Pankow, Germany), and for the formulation of design hypotheses for a diffuse city context (in Lambermont, Belgium).

In the light of the research gap, the act of revealing the spatial impact of the surfaces mobilised by the system of automobility – a system doomed for obsolescence – can offer morphological and quantitative information which can serve as a first step to questioning the future of these spaces. Combined with an in-depth knowledge of specific local contexts, it can serve as a basis to explore their potential to be reimagined as a structural element of a territorial project capable of responding to the ecological, social, and economic challenges of the transition.

9·3 THE UNTAPPED HYDROLOGICAL ROLE OF SECONDARY STREETS OF BERLIN-PANKOW

The following set of maps from Berlin-Pankow are used to highlight the ecological role of the space of automobility in an urban environment. Even in less densely built typologies, transforming road space can greatly mitigate the disturbances on the water cycle caused by anthropic soil-sealing. Indeed, compared to a landscape devoid of any human interference, an urban environment heavily disrupts the water cycle in many ways: canalised waterways are more vulnerable to flooding, a lack of vegetation reduces evapotranspiration, impermeable surfaces, and the presence of drainage networks accelerate water flows and deplete the aquifer, therefore augmenting the risk of both water shortages and surpluses. If major and radical changes are not rapidly implemented in the way urban areas are designed, these adverse effects are expected to intensify through the double action of climate change (providing fewer, but more intense rain events), and population growth (potentially reducing the amount of available permeable surfaces).

This research project (Benettin et al., 2022a), located within the Pankow neighbourhood in Berlin, Germany, aims to model and represent the behaviour of water precipitating upon an urban environment, measuring the day-by-day water quantity distribution pattern, which is either being either discharged by the drainage network, evaporated by vegetation, or infiltrated into the ground. These patterns are tested at a one-metre resolution on four areas of the case study site, chosen to represent its four dominant built typologies: pre-war block housing, post-war slab housing, single-family housing, and industrial area. Each typology similarly features between 17% and 24% of the surface occupied by buildings. The results of the hydrological model (Gillefalk et al., 2021) are then represented on a series of maps [fig. 1].

Using the same hydrological model, several design strategies aimed at decreasing asphalted areas and/or increasing the amount of vegetation are modelled on the same four areas, and their impact on water distribution pattern spatially represented and quantified ●. Those design strategies are not focused on altering the built fabric of the site, by changing the amount of built surface, but rather on transforming the open areas between buildings, thus operating on the very elements which constitute the space of

automobility: parking surfaces, driveways, sidewalks, primary and secondary streets.

Of these strategies operating on the non-built environment, the transformation of secondary streets from paved roads to gravel surfaces (thus encouraging a lighter traffic load) consistently ranks among the most effective design strategies modelled in the project, showing remarkable effects across built typologies. Secondary streets are defined by being surfaces designed almost exclusively for sparse local automobile traffic. These include residential roads on the public domain, but also driveways and building accesses on private land. From these surfaces are excluded main roads, parking spaces, sidewalks, as well as surfaces for logistics and storage. The types of secondary streets differ between the built types, and their cumulative area can vary between 7% to up to 39% of the case study area.

The maps which make up Figure 2 show the amount of water leakage towards the aquifer in the existing situation, as well when removing asphalt or pavement from these surfaces. The behaviour of gravel surfaces on secondary streets is visually very notable (especially compared to vegetated areas). Indeed, the amount of soil leakage mostly follows a linear correlation with the proportion of sealed surfaces and precipitation intensity. However, one can observe the mitigating effect of vegetation, especially during weaker rain events, when more water will evaporate than recharge the aquifer. Thus, gravel surfaces feature the best infiltration ratio. Through this map, both the vast surfaces occupied by these secondary streets, as well as their potential role as hotspots for water infiltration and aquifer recharge within many diverse urban fabric types are made visible.

9·4 TAKING STOCK OF SEALED SPACES IN EAST BELGIAN'S GREEN PARK, LAMBERMONT

A second set of maps, sampling the village of Lambermont, Belgium, aims firstly to find out if, by comparing quantitative data, a similar ecohydrological potential of sealed spaces can be observed outside large metropolises, within the diffuse city-territory. Secondly, considerations about the specific qualities of the spaces will be drawn. Indeed, even within a loosely urbanised territory – that one could consider 'rural' – the amount of soil designated for urban uses (in opposition to agriculture and natural habitats) can in fact be surprisingly high. In the Geneva Canton territory, for example, despite a strive for compact city-building and the preservation of an agricultural landscape, no less than 45% of the Canton's total surface are assigned to an urban function (buildings, roads, but mostly lawn and other paved surfaces), while only 35% are dedicated to agriculture (HRC, 2020).

Two representative samples were selected, coexisting within two kilometres of each other: single family housing purposefully built for the automobile, as well as the historical village core, retrofitted to add transport and parking facilities to an environment predating the car.

Mapping the true scale of the space of automobility is especially revealing while concentrating on historically rural villages, which today are a constitutive part of a much wider city-territory. One such representative

case highlighting the problematic of rearticulating the spaces linked to mobility is located in Wallonia [fig. 3], on the ecological corridor linking the green core of the transborder 'Euregio Meuse-Rhin' metropolitan region and the Ardennes Forest (Blaffart et al., 2018). The village of Lambermont, overlooking the Vesdre valley, serves as a classic example of the promises offered by the Belgian diffuse city model, in which the urbanisation of the countryside, avoiding large scale immigration towards city centres, has been encouraged since the industrial revolution through several waves of mobility infrastructure projects and policy incentives enabling the dream of owning a house located 'close to nature' (Smets, 1986; Grosjean, 2010).

The figures above and below showcase one important paradox when addressing the imaginary of such places. The common perception (not only popular, but also by planners) is mostly in line with a rustic, bucolic landscape such as the image on the left of Figure 4. However, mapping the space linked to the automobile in two representative areas of the settlement (the village centre and a new single-family housing area) tells a different story. Indeed, using high resolution aerial imagery and object-based image analysis software (Lennert et al., 2019) to highlight paved areas, one realises the car, while physically occupying 2% of the studied area, claims no less than 30%, respectively 33% of the whole surface. The resulting tentacular figure – which in the single-family housing neighbourhood represents more surface than the building footprint – not only is made of new infrastructure aimed at hosting the car, but also encroaches on historic public spaces, transforming the market and church squares into open air parking lots.

9·5 DISCUSSION

The table below offers a comparison between the surfaces allocated to automobility in each sample. These surfaces are classified between primary usage (by cars or by pedestrians) and property regime (private or public land), as well as put in relation with the building footprint.

In each of the three samples, the total sealed open space area is rather consistent, between a fourth and a third of the total ④. One can observe that for settlements purposefully built with the car in mind (be it near central Berlin or in the diffuse city), each housing unit is provided with one and a half times its footprint in road space. In an urban fabric retrofitted for car use, the amount of sealed space provided is roughly the same, despite vastly different building typology and available space between facades. This is achieved by appropriating pre-existing public squares (e.g., in front of the church or the city hall). Even if private backlots or ground floors of buildings are also used, most of the burden of this adaptation to the system of automobility has happened on public land, at the expense of civic infrastructure.

Furthermore, as highlighted through the lens of ecohydrological modelling, the potential for a further regeneration of the spaces of automobility can yield significant results, without altering building density or completely abandoning vehicular traffic. Nevertheless, despite the flattening effect automobility applies on very different urban fabrics (all allocated about

the same amount of circulation space), their quality can be very different, necessitating a carefully contextual approach when envisioning their transformation in a context of diminished car usage.

9·6 CONCLUSION: TOWARDS A NEW TERRITORIAL PROJECT FOR THE TRANSITION

This paper has addressed how cartography can fuel reflections concerning the design of the spaces of mobility in a post-car age. From a series of maps have emerged some considerations regarding the design potential within the diffuse city. In other words, how can the spaces of automobility in the diffuse city become levers of transition within a post car future? Discussion about adapting our settlements to the challenges of transition should not only be narrowly focussed on buildings alone but should include strong stances on an artificialized space the system of automobility demands to be over one and a half times larger than building footprints. While these starting points may be similar, a future project in a context of diminished car usage will necessitate diversified planning approaches, depending on significant typological, as well as context-specific differences: reduce the encroaching of historic public spaces toward a mixed-use ex-ante situation, or strive for an original unwinding of a bloated arborescent circulatory complex?

This analytical approach to the spaces of automobility today can also help to address the shortcomings of current planning practices designed to reduce the car; shortcomings which, as exposed above, are focussed on a small part of the territory, while relying on a caricatural understanding of the diffuse city and its main unifying feature: a viscous grey-black glueing agent named asphalt.

Literature highlighting the potential for the city-territory, as a unique blend of urbanity and naturality, to play a role in the transition is plentiful (Sieverts, 2004; Brès et al., 2017; Barcelloni Corte and Viganò, 2022). As a constitutive part of this condition, the spaces of mobility can serve as an important lever for change.

	Berlin-Pankow, Single family housing	Lambermont, Single family housing	Lambermont, Village core
Built area	17%	18%	43%
Total sealed open space	24%	32%	31%
Sealed space to building ratio	1.41	1.78	0.72%
Space for the car, public land	7%	16%	21%
Space for the car, private land	15%	10%	6%
Space for pedestrians	2%	6%	4%

tab. 1. Percentage of sealed space by sample, classified by use. Credits: elaborated by Cédric Wehrle.

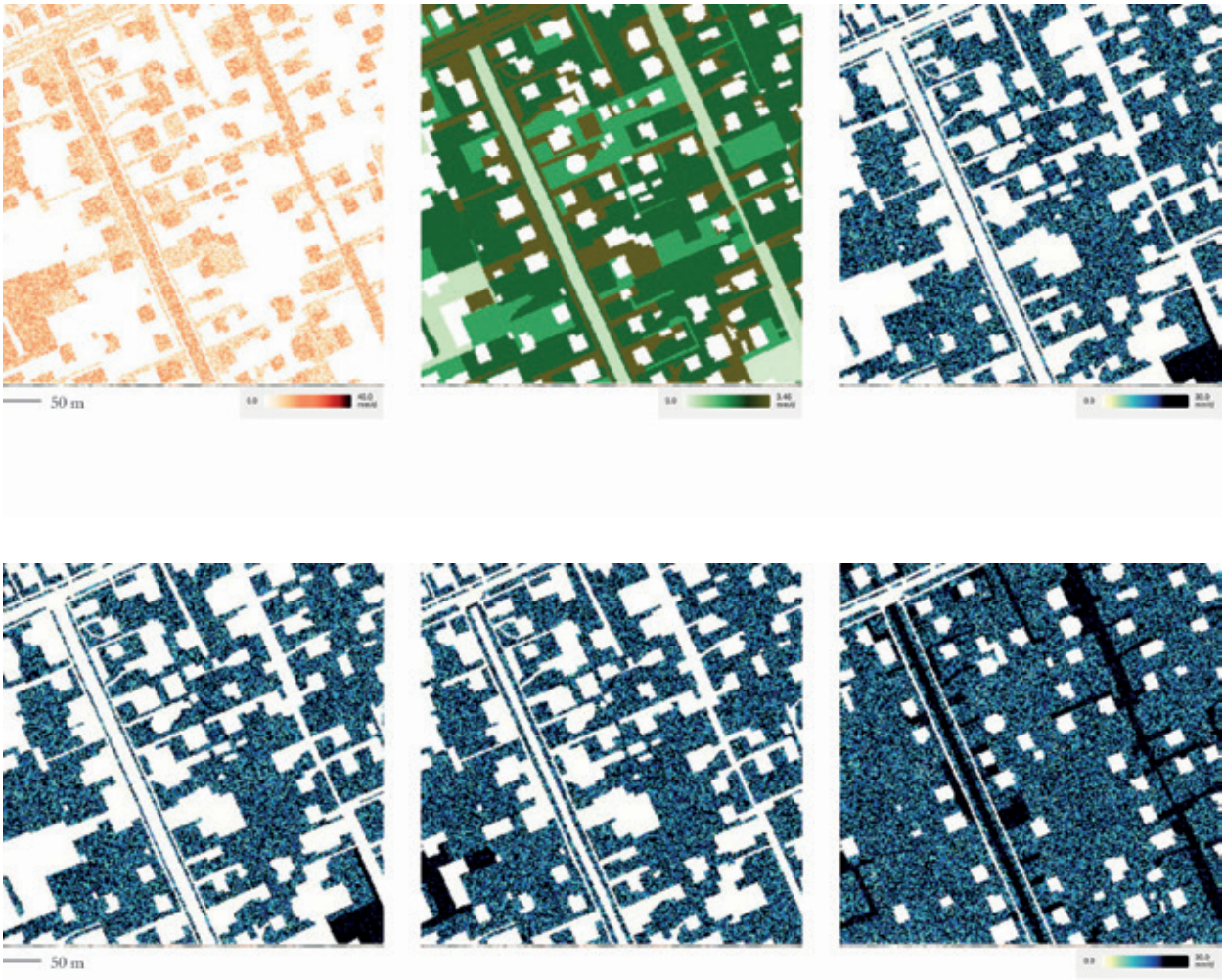

fig. 1. Water distribution pattern in a single-family neighbourhood in Berlin-Pankow, one day after a large rain event. From left to right: surface water discharge, evapotranspiration, and infiltration. Credits: elaborated by Cédric Wehrle in Benettin et al., 2022b.

fig. 2. Increase in water infiltration following design interventions, one day after a large rain event. From left to right: current condition, conservative intervention scenario, radical intervention scenario (featuring de-paving secondary streets) Credits: elaborated by Cédric Wehrle in Benettin et al., 2022b.

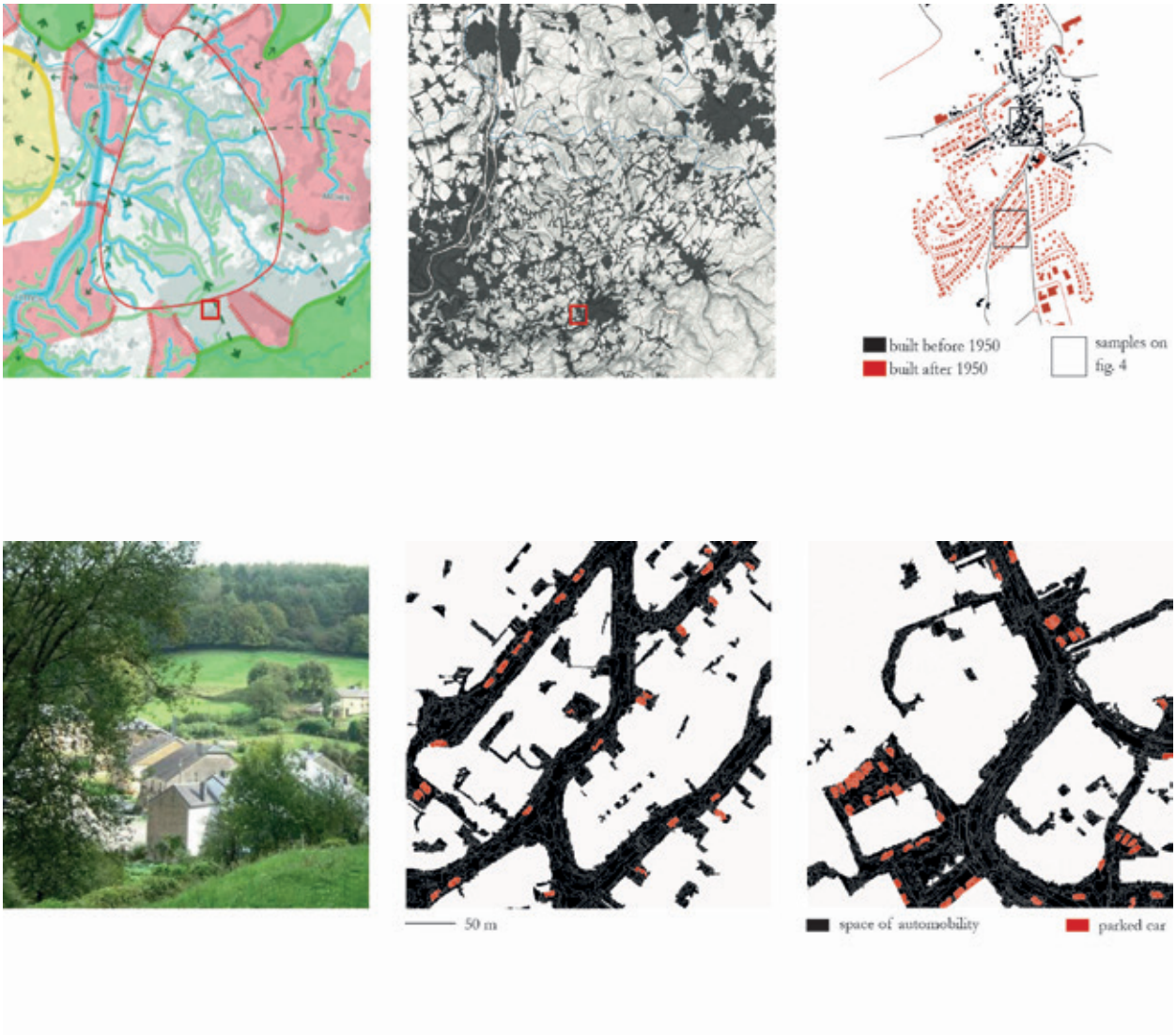

fig. 3. Lambermont, Belgium. From left to right: location within the green core territorial figure, land cover map for comparison, evolution of the built fabric. Credits: Blaffart et al., 2018 (left), elaborated by Cédric Wehrle (centre and right).

fig. 4. Lambermont, Belgium. From left to right: view of the village in phase with its rural imaginary, space of automobility and car parked, in the village centre and in a single-family housing neighbourhood. Credits: Wikimedia Commons (left), elaborated by Cédric Wehrle (centre and right).

ENDNOTES

①: Such paradoxes include spaces neutralised by industrial conventions (Alonzo, 2018) producing novel ways of living, highly urbanised territories without an explicit project, accessible yet in a fractured way (Pope, 1996), where local differences are erased while new fragments are carved by infrastructure (Graham & Marvin, 2001), impending on natural realms while augmenting the interfaces between built and unbuilt (Brès et al., 2017).

●: The 'post car' discourse should not be misunderstood as a strive for complete elimination of private motorised vehicles, but rather a re-questioning of their hegemonic power in spatial decision-making processes.

●: The full set of maps and data of this interdisciplinary project is featured on an online interactive platform (Benettin et al., 2022b).

④: These numbers are also consistent with similar counts made in North American agglomerations such as Los Angeles, San Francisco, Phoenix, and Las Vegas (Chester et al., 2015; 2022).

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1 COLLATERAL MOUNTAINS: THE CASE OF THE WESTERN ALPS

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The development of the Alps has been defined, since the second half of the nineteenth century, by exogenous phenomena that have changed these territories' physical, social and economic contexts.

This work identified three possible case studies: three valleys in the Western Alps that share a history related to hydroelectric development in the region, with the subsequent depopulation of the mountains and the decline of this activity since the 1970s. Due to the enormous amount of raw materials required for the ecological transition, new extraction prospects are underway. It reverses the trend of relocating these activities in recent years and opens new debates around the territorial project. Considering these inner areas and their relationship with the entire territory inquires relevant topics for the contemporary urban debate. More specifically: the interpretation of the contrasts of an auxiliary territorial system, the relationship between productive ecologies and territorial imbalances, and a critique of the revitalisation processes of a disputed territory. The essay analyses and relates the different stages of exploitation, new global-scale issues and the prospect of self-sufficiency.

10·1 THE SPATIAL PATTERN OF POST-EXPLOITATION LANDSCAPES IN TRANSITION

The media representation of the Alpine region as a recreational or rural region leads to a focus on abandoning facilities related to these sectors ①. Little attention is given to the problem of abandoned and underutilised industrial sites (Corrado & Sega, 2019; Modica, 2019) and their network ●, which includes the extraction and exploitation areas of resources and energy production. Since the second half of the nineteenth century, the Alps' development has been defined by exogenous (Debarbieux and Price, 2012) and extractive (Arboleda, 2020) phenomena ④ that have changed these territories' social and economic contexts ●. As a morphological entity, the Alps represent these dynamics, based on a recent past where they were a place of experimentation and innovation. The population of the Alps increased by 57% between 1870 and 1990, a growth rate still significantly below the European average (Bätzing, Perlik, and Dekleva, 1996). In contrast, a large Alpine region has suffered severe depopulation. The decline of this area was partly caused by the lack of subsidies for mountain regions (De Rossi, 2018) but is also the result of a large-scale weakness in the regional economy and infrastructure.

The European Union's Green Deal includes policies and programs ● that will encourage the massive expansion of mining – of non-renewable resources – with consequences for the climate, ecosystems, and local communities (Bell & Donnelly, 2006; Sengupta, 1993). Cobalt is a critical material in many sectors and an essential component of lithium-ion batteries ●; in 2020, the European Union included it among the primary "strategic interest" materials. Several cobalt vein deposits were formed during the Alpine orogeny in the Eastern Alps, which gave rise to the mining districts in the past ● and are now being investigated by several international companies. However, today it is no longer possible to think of the mountains as a 'natural' reserve and a loisir for the non-stop growing cities (Dematteis, 2009). To face increasing climate change and the resulting climate crisis, several Alpine areas are experimenting with solutions involving the reconversion parts of old hydropower plants and using renewable energies to achieve energy self-sufficiency.

The Alps are a dynamic organism, on which the period of human influence can be considered very short, yet capable of significantly reshaping the territory. This relatively rapid change offers a range of new potentials. In the past two decades, interest has grown ● in mountains and Alpine territories (Pascolini, 2008). By examining these phenomena, the focus is reversed, bringing what is generally considered marginal to the 'centre' (Carrosio, 2019). The mountain has assumed a central role and is no longer an external territory. To reconsider – in a non-conflictual way – the relationship between city and mountain, the city must not be understood as a centralised form (Brenner, 2014), and the mountain must be considered not only as an additional element but as an integral part of this complex system (Meili, 2006). Through the analysis and combination of different territorial layers, such as networks, boundaries and differences, new disciplinary fields of research can be defined (Schmid, 2006). The scientific debate is

accompanied by considerable media interest, demonstrating a process of resignification of the highlands (Ferrario and Marzo, 2020).

This work aims to investigate the Alps through how they relate to the other and otherness (Simmel, 2008) using this view as a research device. This tool describes the structure and modes of interaction of a complex territorial network resulting from a series of alterations provided by direct or indirect human actions (Banham, 2006).

10·2 THREE VALLEYS WITHIN THE WESTERN ALPS. HISTORICAL BACKGROUND AND CURRENT CONDITIONS OF THREE DIFFERENT INNER AREAS

This work identified three geographic areas within the Piemonte Region Alpine arc case study. These three areas are analysed through main themes, referring to other more specific aspects necessary for a framework of possible scenario(s) (Viganò, 2010).

The three areas have different morphological, infrastructural, and economic characteristics. However, they share a history linked to the region's hydroelectric development (Bolzoni, 2006; Bonoldi and Leonardi, 2004), with the following depopulation of the mountains ⑩ and the decline of this activity since the 1970s (Modica, 2022).

The Turin metro-mountain (Dematteis, 2018) is a relational space where economic, social and cultural characteristics come mainly from interactions with the metropolitan area. The first significant use of water resources in the western Alpine region was the result of the energy policy of the city of Turin (Pavese, 2007). The market perspectives were boosted due to a demonstration of remote public lighting during the 1884 industrial exhibition: Lucien Gaulard's won a special prize for the "best electrical transmission to Turin from the Alps" and attracted foreign attention to the area. Thanks to the interest of several companies, the power plants built in Piemonte increased fivefold (Calligaris, 2004). The Piemonte region's electricity production and distribution industry assumed a monopolistic configuration, promoting a process of polarisation of transformation activities. Since the 1970s, many plants have been abandoned because they were no longer competitive. The intense occupation of mountains had symbolic and physical consequences, and depopulation is expected in this area, with a continuous increase in the elderly population. This trend has already started with the industrialisation process, and the risk is the proliferation of second homes without an approach based on providing services to residents. The current view defines a relationship between concentrated urbanisation and the extended one, including the operational landscapes (Brenner and Katsikis, 2020) of production and resource extraction ⑪. In 2019, the Piemonte region granted a mining company, the Australian Altamin, a licence to explore for the presence of cobalt, nickel, copper, silver, and associated minerals in the area of Punta Corna ⑫, 2,960 metres above sea level, including in the territory of Usseglio and Balme ⑬. In December 2022, the licence was renewed and extended to start a second exploration phase ⑭.

The Val d'Ossola extends to the Swiss border in the northern part of Piemonte, a valley corresponding to the Toce river basin with an architectural and landscape heritage characterised by the Walser rural tradition. It is also included among the Italian National Strategy for Inner Areas pilot projects. At the end of the 19th century, the Val d'Ossola entered a large electrical industry, which accelerated the process of structural transformation and had already begun with the extension of the mobility network. The importance and frequency of large-scale works erase the agro-pastoral economy and the Alpine pasture system of the upper and lower valleys, reducing income from forested land to zero. The electrical industry's growth profoundly altered the economic and social balances achieved for centuries in the western Alpine arc; even today, the demographic crisis is concentrated in mountain areas (Caligaris, 2004).

It leads to housing imbalances in the area, with growth phenomena in the lower part due to the presence of active industries. Combined with connective difficulties, it leads to other phenomena of abandoning portions of the territory. National and nature parks play a crucial role (Armiero & Hall, 2010) in the decision-making process of the entire valley's area ⑮, and artificial elements are also hosted and preserved within them. In addition to Punta Corna, additional explorations are conducted in Valsesia and towards Ossola Valley by Alligator Energy Ltd ⑯. Current resource estimates are yet to be available.

The protests and associationism of the municipalities in Valle Maira in the early 1900s demanded an energy policy capable of rebalancing the energy production for export, in contrast to the economic interests of the companies involved (Caligaris, 2004) ⑰. These practices concerned the energy infrastructures directly involved and the emergence of a collective awareness that influenced energy policies and landscape choices over the years. Thanks to a regional law in force since 1973, which denies the possibility of expansion and building from scratch and binds the use of local materials and construction techniques, the valley, from an abandoned area, is now one of Europe's main slow tourism destinations (Rabbia 2016). A long tradition of association practices has deeply influenced the Valle Maira landscape. In 2021, the Valle Maira and Valle Grana mountain associations set up Italy's first large-area energy community – entirely public – to study and promote energy efficiency in the valleys through renewable sources and self-consumption.

10·3 HOW TO THINK OF POSSIBLE SCENARIOS IN A POST-EXTRACTIVIST FRAMEWORK?

In the mountains, the depopulation involves shifting the Alpine population to the valley floor, where the large-scale industry is located, thus reversing the relationship between low-lying and upstream municipalities. This is the main element in changing the complex economic and social balances of traditionally rural areas such as many portions of the Western Alps. In other parts of the mountain territory, the emergence of the electrical industry represented a confirming factor for new balances that were

being consolidated, with a gradual abandonment of an economy based on self-sufficiency (Turri, 2014).

The analysis of an Alpine space and the system of metropolitan relations and the transformations produced by planetary phenomena (Brenner, 2014; Schmid, 2006) – such as climate change and socio-economic globalisation – makes it possible to define the role of design which is consistent with the contemporary socio-economic agenda. It must focus on the constellation of small depopulating villages, identifying services needed by the elderly resident population, strategies for second homes layer, and dealing with abandoned energy production landscapes. By overlapping and developing the different layers (Viganò, 2010) of this complex territory, it is possible to define temporary layouts in a framework of migrating landscapes (Milligan, 2015). Brownfields should be considered territorial infrastructures (Modica, 2022), focusing on their network of relationships and the possibility of implementing design strategies for elements that have become landscape clichés and commonly identified as natural. This background allows us to reconsider the relationship between productive ecologies and territorial imbalances.

Increasingly considering mountain territories as natural and fragile assets can lead to contradictory policies, with minor sensitivity to local and regional phenomena favouring top-down instances. They are consistent with general policies but often do not consider the mountain environment's specificity and heterogeneity (Bätzing, 2015). On the other hand, many states have included the metals used for batteries in their critical raw materials list. The ecological transition will require unprecedented raw materials to manufacture batteries. As mentioned, the territories of the Piedmont Alps possess great potential in terms of resources, especially cobalt (Horn et al., 2021). The historical analysis of the various exploitation phases leads one to think that – accepting the ecological (van den Brink et al., 2020) and landscape damage brought about by mining – this process will not promote socio-economic development on a local scale. Assuming this does not mean justifying extraction practices in other parts of the world (Sun et al., 2019) but understanding how research can test alternatives imposed by the climate emergency and consequent policies on a European scale. The scenario should therefore question alternative possibilities, asking what if these valleys became energy self-sufficient, highlighting the new relationships with the valley floor and the impacts at various scales, especially at the local one. Thus, the scenario can provide an interpretive framework of the contrasts of an auxiliary territorial system in transition through an analysis of paradoxes and repercussions at the local scale. In conducting this operation, the territory must not be considered as data but as the result of different processes (Corboz, 1983). In addition, the proposed scenario must be a possible operational tool and not just propaganda for political decisions. Indeed, times, different scales and actors assume a leading role.

ENDNOTES

①: The representation, through the media, and the creation of an immaginario based on the picturesque and sublime character of its landscapes has meant that little relevance has been given to the following factors in action.
●: Today, the result is a landscape composed of waste places, which include large industrial buildings and spatial infrastructures for energy production, as well as the residential neighbourhoods connected to them (Berger, 2006). A lack of public space typical of the expansion phase of diffuse urbanisation characterises these urban clusters.
④: These activities are concerned with the exploitation of resources but also with recreational activities economy.
●: For an in-depth review of the modification and transition of these territories: 'Cajamarca: mapping (Post) Mining palimpsests of the Peruvian Andes' (Macera, De Meulder, Shannon 2020). The essay highlights how mining, in addition to other human activities and natural phenomena, has repeatedly reshaped the landscapes of the Peruvian Andes. It then discusses how environmental reconstruction after the closure of mining recreates a landscape that erases the traces of mining and restores natural conditions, 'returning to nature' without any hint of human action. However, this reconstruction can only be hypothetical, as it does not consider the palimpsest's stratification. The essay, therefore, introduces a post-mining cultural landscape scenario as a possible alternative.
●: Several international companies are now investigating these perspectives.
●: Ranging from chemical, metal, graphics industry, and electronics to healthcare. Cobalt is used in laptops, mobile phones, and electric vehicle batteries.
●: High cobalt grades supported these districts intermittently from the 16th century until the 50s.
●: Acknowledging the complex relationship of human-nature interaction (McHarg, 1963), especially in the mechanisms and criteria of social choice in the world (Meadows et al., 2012), ecology is now one of the most influential factors in collective decision-making (Dryzek, 1987).
⑩: In the western Alpine region, these processes created imbalances in spatial development resulting from the fact that, for the first time, thanks to large-scale distribution, the availability of energy was no longer a constraint for the location of production facilities.
⑪: The practices are seemingly incompatible with the perception and image that still characterises the Alps. The creation of production facilities and tourist infrastructure for the enjoyment of Alpine landscapes compose a similar system of appropriation and exploitation of Alpine space, environment and resources. In the first case, the creation of infrastructure is based on a strictly productivist logic, and in the second case, on an ideological system based on an aesthetic relationship with nature (Lorenzetti, Valsangiacomo, 2016).

⑫: The Usseglio mine has been exploited since 1753. Cobalt was mined for use as a pigment. In the 1930s, when mining the mineral in the high mountains became too expensive, was closed.
⑬: Usseglio and Balme are located in the Lanzo Valleys. The two towns, Characterised by strong depopulation, maintain an economy based on tourism, especially in summer and agro-pastoral production. The Usseglio mines have been exploited since 1753. Cobalt was used as a color pigment. In the 1930s, when mining the mineral in the high mountains became too expensive, the Punta Corna mine was closed.
⑭: Altamin, ASX Announcement, 8 December 2022, Punta Corna Project cobalt-nickel- silver exploration licence granted & expanded.
㊳: The parks created in the Italian Alps, since those during the fascist regime, are located in heavily anthropized areas, as are most European parks. It is, therefore, difficult to draw clear boundaries between 'natural' and 'artificial' landscapes and to create a park without provoking social conflicts related to access to resources (von Hardenberg 2011).
㊴: Alligator Energy, 29 September 2022, ASX Announcement, Piedmont Nickel-Cobalt Project – Ground EM Survey Commenced.
⑰: In those years (1900-1920), the economy of the Maira Valley was thus confronted with the problem of energy transfers out of the province, which went hand in hand with the increased autonomy of lowland agriculture compared to alpine agriculture, going through an involutional process that transformed temporary emigration, organic to the alpine pastoral agricultural system, into definitive emigration.

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ON TRAVESÍAS

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The contemporary phenomena of commodification and the subsequent depletion of hinterlands in the South stand as pivotal issues, emblematic of the Anthropocene era.

These pressing challenges demand a re-evaluation of design paradigms toward transitions that transcend the boundaries of conventional urban landscapes and engage with more nuanced modes of perception, knowledge, and action. Simultaneously, this necessitates a re-examination of the deeply ingrained paradigms of modernity and coloniality within design epistemologies and ontologies.

Within this context, this research contribution presents the findings of a doctoral investigation that centres on the repositioning of the geo-poetic design approach introduced by the School of Valparaíso through the former *Travesías de Amereida* (1964-1984). This radical pedagogical project serves as a platform for scrutinizing the complex positionalities inherent in contemporary processes of non-urban urbanization in South America. It delves into how the Valparaíso School's collective pedagogical experiences, as exemplified through the *Travesías de Amereida* conducted across the continent, facilitate the establishment of interdisciplinary positions.

This paper underscores the development of an unconventional geo-poetic foundation that enables a critical examination of the colonial aspects of urbanization in the South American hinterland. Ultimately, this contribution seeks to underscore the profound epistemological importance of *Amereida*'s geo-poetic principles within the fields of urban design and architecture, offering valuable insights and fresh perspectives.

INTRODUCTION

In the domain of Cultural and Design Studies, current discussions are focused on the pathways of contemporary urbanization and capitalism, recognized as the central drivers of modern ecological paradigms and and the evolving approaches towards design transition (Escobar, 2018). This discourse prominently underscores the controversies related to the Global South, particularly its hinterlands, which have historically symbolized underdevelopment while concurrently functioning as a critical resource for the global expansion of Western modernization and planetary dissemination (Shiva, 1991).

The term hinterland, while traditionally referring to remote areas situated far from coasts, riverbanks, or cities, does not easily equate to the terms rural or countryside. It signifies a complex relationship between the urban and rural, traditionally commodified as a resource or capital through agriculture and resource extraction. Presently, this space intersects with the neo-colonial and ecological challenges of rural areas, with both being perceived as lagging behind the metropolis, the processes of globalization, and even modernity itself (Peeren et al., 2021). However, unlike the rural, which is often associated with ideals of retreat, colonial nostalgia, and nature preservation, the hinterland, as a hybrid urban-rural space, is characterized by wastelands, desolation, sites of racial exclusion, and industrial and extractive landscape degradation (Tsing, 2016). For critical scholars (Quijano, 2007; Mignolo, 2000), the present portrayal and perpetuation of hinterlands in the Global South are intricately entwined with the concept of coloniality. Coloniality encompasses the historical practices and knowledge deeply ingrained in postcolonial regions, serving to maintain hegemonic epistemologies and ontologies originating from global centres and imposed upon peripheral regions. Within this theoretical framework, power dynamics and hierarchical relationships are critically examined, with the aim of challenging contemporary positionalities and promoting intercultural learning.

Against this backdrop, and with the goal of investigating positionalities while studying the urbanization of hinterlands, this contribution seeks to explore the epistemological and ontological underpinnings of design education and research in the context of urbanism and urbanization processes beyond traditional metropolitan areas. To achieve this, the paper delves into the South American geo-poetic design approach rooted in the Valparaiso School in Chile, as manifested through the *Travesías de Amereida*—a series of collective pedagogical design experiences conducted throughout the South American hinterland.

This contribution primarily focuses on reassembling historical records concerning the poetic, geographical, and epistemological design principles that underlie Travesías de Amereida (1940–1984). Additionally, it employs the concept of de-linking, as introduced by decolonial studies, to explore the positionalities that shape the specific situated practices and poetic principles of *Travesías de Amereida*. The notion of de-linking, developed by the Argentine philosopher Walter Mignolo, involves grasping the tools and foundations that allow us to interrogate the rationale of modernity/coloniality, which, in this context, influences the representation and

transformation of territories beyond traditional metropolises. In this line, this contribution aspires to provide a critical approach to the positionalities connecting *Travesías de Amereida* with the situated study of territories beyond the conventional institutional spaces, such as labs and faculties, and examines the connections with hybrid narratives related to coloniality, offering a space for interrogating epistemologies and ontologies from a design perspective.

ON TRAVESÍAS

In 1964, following an extended sojourn in Europe, the Argentinian poet Godofredo Iommi returned to the School of Valparaiso in Chile ①. His homecoming was motivated by a deep aim to rekindle his engagement in the intricate interplay of poetry and pedagogical practices within the field of architecture. These practices had taken root in the institution during the 1950s, coinciding with his role as a professor. However, his return to Chile was not merely a continuation of this ongoing project; it was closely tied to a philosophical inquiry deeply entwined with the South American territory. Thus, Iommi conveys an exploration on the ontological question about Latin American identity and the pivotal role of poetry and the arts in shaping responses to this question. This exploration unfolded within a rich realm of socio-political, economic, and philosophical which were particularly salient in the Latin American context of that decade, marked by an intense yearning for development.

In 1965, Iommi, in collaboration with the School of Valparaiso and a small group of Latin American and European artists and intellectuals who had convened previously in France, embarked on a poetic odyssey across the South American hinterland, aptly named the *Travesía* (crossing). Their aim was to revisit the fundamental question of what it truly means to be American, with a particular focus on a Southern perspective (Iommi, 1982). This journey sought to transcend the confines of their everyday metropolitan existence and ushered in a situated perspective that revisited the territory and history as a palimpsest – a layered tapestry of time. The group acknowledged that, since the era of colonization, the South American continent had been relegated to the role of a mere backdrop for the march of modernity. For them, this relegation transcended mere geography; it had permeated the cultural and intellectual constructs that emanated from the metropolises (Mercado, Grulois, 2020). Moreover, the quest to comprehend the essence of being American extended far beyond the realms of individual introspection and poetic expression. It manifested as an audacious, transdisciplinary, and transcontinental endeavour, aptly termed the *Travesía*. This crossing entailed an expedition across the South American hinterland, distanced from the colonial metropolises that had long defined the continent's periphery.

The *Travesía de Amereida*, which transpired between July 30 and September 15, 1965, can be seen as a sequence of performative acts, some of which had already been cultivated within the School, including poetic acts and the architectural observations. Nevertheless, the embodiment of scales and their significance were heightened due to the profound interplay

of poetry and geographical exploration that guided the expedition. These acts [fig. 1] were collaborative and playful endeavours, designed to engage with the diverse identities, locales, and inhabitants of the South American hinterland. Poetry and craftsmanship served as instruments for challenging preconceived notions. This journey and the performance of collective acts and interventions with the land and its people became a means to delve into alternative experiences, wisdom, and ways of life through poetic action.

Within the context of the School of Valparaiso, the *Travesía* emerged as the foundation for a bold epistemological initiative, with a focus on unlearning, rooted in the trope of the unknown. This approach critically invoked the colonizing experiences of European conquerors and naturalists who traversed the southern regions, as exemplified by figures such as Columbus, Vespucci, Darwin, and Humboldt [fig. 2]. In the *Travesía*, this process of unlearning was particularly centred on shedding light on the ways of inhabiting and crafting architecture in the regional hinterland. This endeavour was traced through creative practices such as drawing and mapping, as developed in the bitácoras -–travel logs [fig. 3]. Subsequently, these practices were further honed and expanded upon by students and professors at the School once the *Travesías* were integrated in 1984 as collective pedagogical experiences [fig. 4]. This situated palimpsest mapping practice, as documented in the bitácoras, is intricately linked to the geo-poetic narrative conveyed in the poem *Amereida* (Mercado, Grulois, 2020).

AMEREIDA, THE HINTERLAND, AND THE INTERIOR SEA

The poem *Amereida*, first published in 1967, stands as a pivotal outcome of the *Travesía*, shaping a geo-poetic narrative that serves as a critical counterpoint while addressing the colonial invention in the Americas and the historical burden that concealed cultures and territories beyond the boundaries of modern metropolises. Notably, the poem *Amereida* bears no listed authors or references. Moreover, it is now acknowledged that other members of the School of Valparaíso and intellectuals contributed to the published version, incorporating passages from chronicles written during the conquest of America, classical and modern poetry, philosophy, and the varied experiences of the group during their journey. This diverse content resulted in a non-linear spectrum of poetic verses, statements and questions that cast a spotlight on the invention of America, particularly in historical events like the chronicles of the conquistadors (Mercado, Salgado Cofré, 2022). These travel narratives were considered essential by the authors for comprehending and addressing the complexities entwined with the European legacy that defined the ontological boundaries of the Americas, Latin America, and South America.

Within *Amereida*, the concept of the Interior Sea is introduced to draw attention to the early European representations of the hinterland, which were portrayed as vast, virtually uninhabited territories, wild and inhospitable to life [fig. 5]. It was often depicted as a *mare magno*, a *terra incognita* open to conquest but also subject to disregard. Such representations not

only delineated geographical frontiers but also held significant ontological implications, demarcating the division between the civilized and the barbarian. In this regard, three maps featured in *Amereida* not only depict the urban context, with the colonial metropolis established at the continent's edges, but they also serve as a critical representation on the hinterland, portraying it as a blank canvas, akin to the European *tabula rasa*.

Although the colonial concept of *terra incognita* shares similarities with the representation of the *Interior Sea*, it's important to note key distinctions. The notion of *terra incognita* played a vital role in European expeditions, underpinning the drive for dominion and mastery over the *Novus Mundus*, as articulated by Vespucci in 1503. It was represented as an empty and uncharted space on maps, serving as an incentive for new explorations to fill in the gaps. Consequently, once this objective was fulfilled, European names were assigned, and the map was deemed complete. In contrast, in *Amereida*, the representation of the *Interior Sea* as a diffuse and boundless expanse evokes the lands that remain ontologically veiled by colonial legacies, a burden that endures even after it is portrayed within the poem and in subsequent voyages and studies undertaken by the School of Valparaíso.

AMEREIDA AND THE COLONIALITY OF TERRITORIAL REPRESENTATION

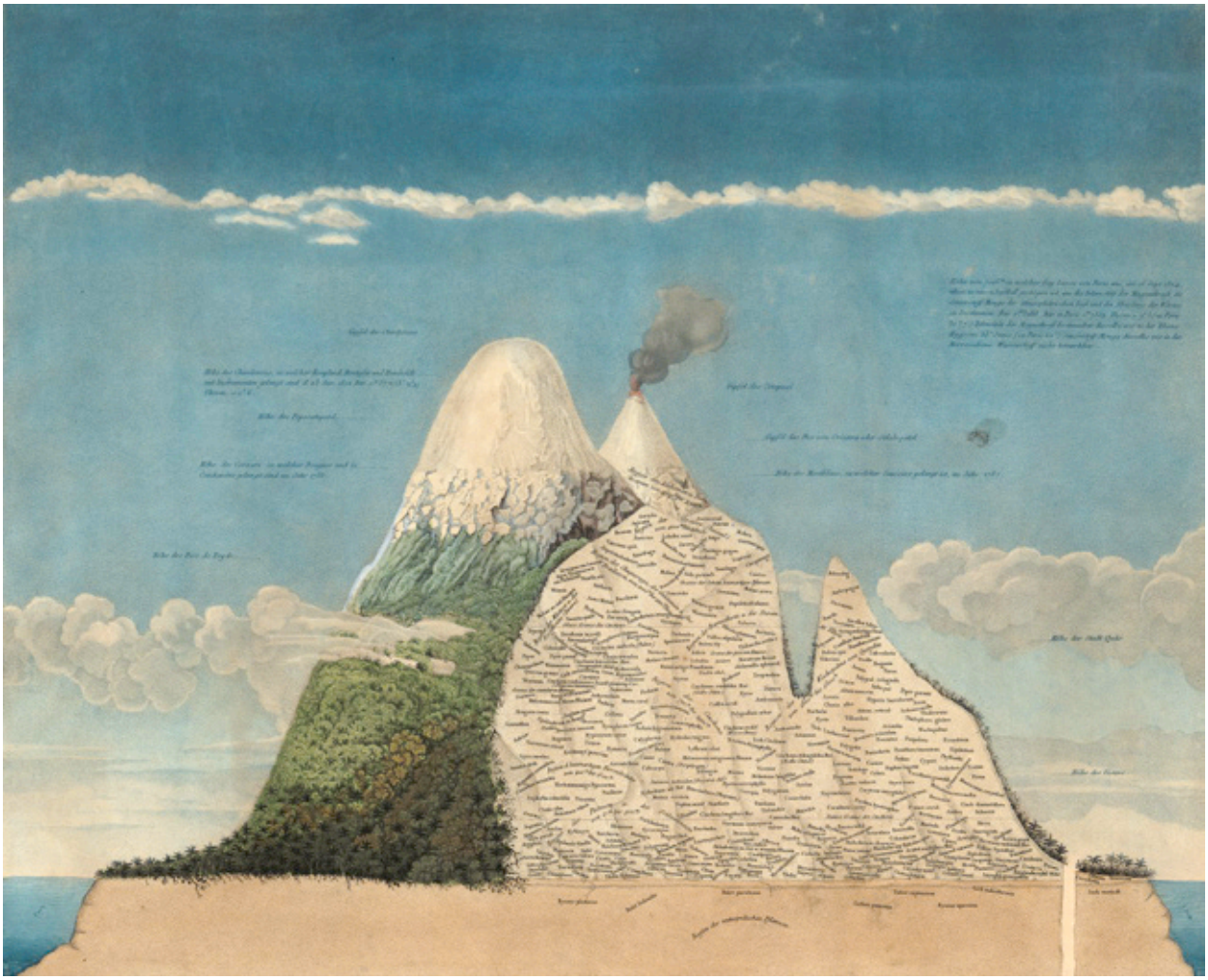
Considering that the representation of the hinterland as *terra incognita* or *tabula rasa* inherently embodies coloniality, we can assert that the notion of the *Interior Sea* emancipates itself from such a rationality. Its purpose is not to flatten or, conversely, complete that space with knowledge or design; rather, it seeks to unlearn from it. In this context, the Valparaíso School may have discerned what art historian Julia Rosenbaum and Latin American cultural historian Ernesto Capello (2020) observed: the cartographers and creators of visual materials from that era, while demarcating borders, accentuating topographical features, delineating natural resources, and attempting to fill in the gaps on maps, were not merely simplifying certain features but also concealing others. As the authors emphasized, "such mapping often rendered invisible, for example, populations and histories in conflict with the state's desires for control, especially in relation to indigenous peoples" (Capello, 2020).

Nonetheless, it's imperative to scrutinize whether the geo-poetic tropes and maps in Amereida embody elements of coloniality. While the illustrations in Amereida challenge the conventional image of America, they are rooted in modern Western cartography, reminiscent of the renowned rotated map of America created in 1943 by the Uruguayan painter Joaquín Torres-García [fig. 6, fig. 7]. According to decolonial scholar Walter Mignolo (Mignolo, 2005), while Torres-García's contribution undoubtedly represents a critical milestone in semiotics and art, it falls short of a thorough interrogation of the weight of coloniality. It essentially "changes the content but not the terms of the conversation" (Mignolo, 2005). Similarly, although the maps in *Amereida* did not have a decolonial approach, their traveling, mapping, and creative practices challenge the foundations of modernism as a cornerstone of architectural practice and knowledge.

In this context, the poetics of making and narrating embedded in *Amereida* bring to the fore questions about positionalities while studying territories and places beyond the everyday realms. This process questions, for instance, the power relations between the metropolitan institution, the intellectual and the otherness once the Travesía or other situated experiences are performed. Within *Travesía*'s fundamentals, the positionalities can be traced in the processes of re-linking and de-linking from knowledge structures and the poetics of gathering beyond colonizing in any means.

Ultimately, it is pertinent to note that the *Travesías* continues to be developed as pedagogical practices within the School of Valparaíso. Therefore, by recognizing coloniality within the questions and practices of *Amereida*, it is essential to question the current relevance of the ontological queries that underpin these creative experiences and narratives. This reconsideration of positionalities comes into play as *Travesías* depart for the South American hinterland.

fig. 1. Members of the Travesía's creating a scultural sign in the Argentine Patagonia, 1965. Credits: Archivo Histórico José Vial Armstrong, EAD.PUC-Valparaíso.



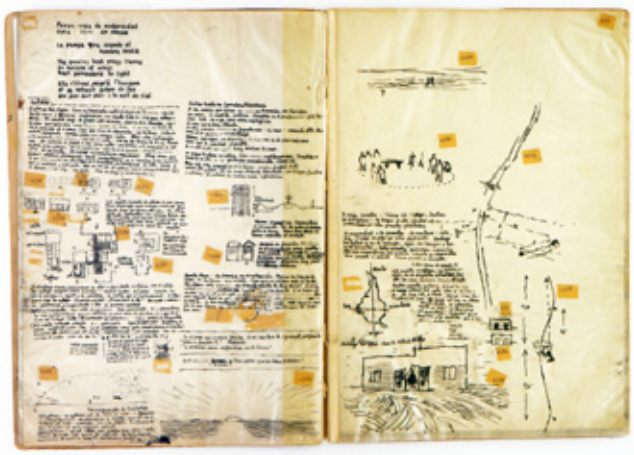


fig. 2. Alexander von Humboldt's 1807 Tableau Physique mapped vegetation onto fanciful versions of the volcanoes Chimborazo and Cotopaxi. Designed by a. Von Humboldt/drawn by Schönberger and Turpin/ engraved by bouquet/typeface by Aubert/printed by Langlois/ Source: Wikimedia commons.

fig. 3. Page of the Travel-log of Alberto Cruz, Travesía de Amereida, 1965. Source: Archivo Histórico José Vial Armstrong, EAD.PUC-Valparaíso.

fig. 4. *Travesía*'s group In the Andes Mountain. Credits: elaborated by Álvaro Mercado Jara.

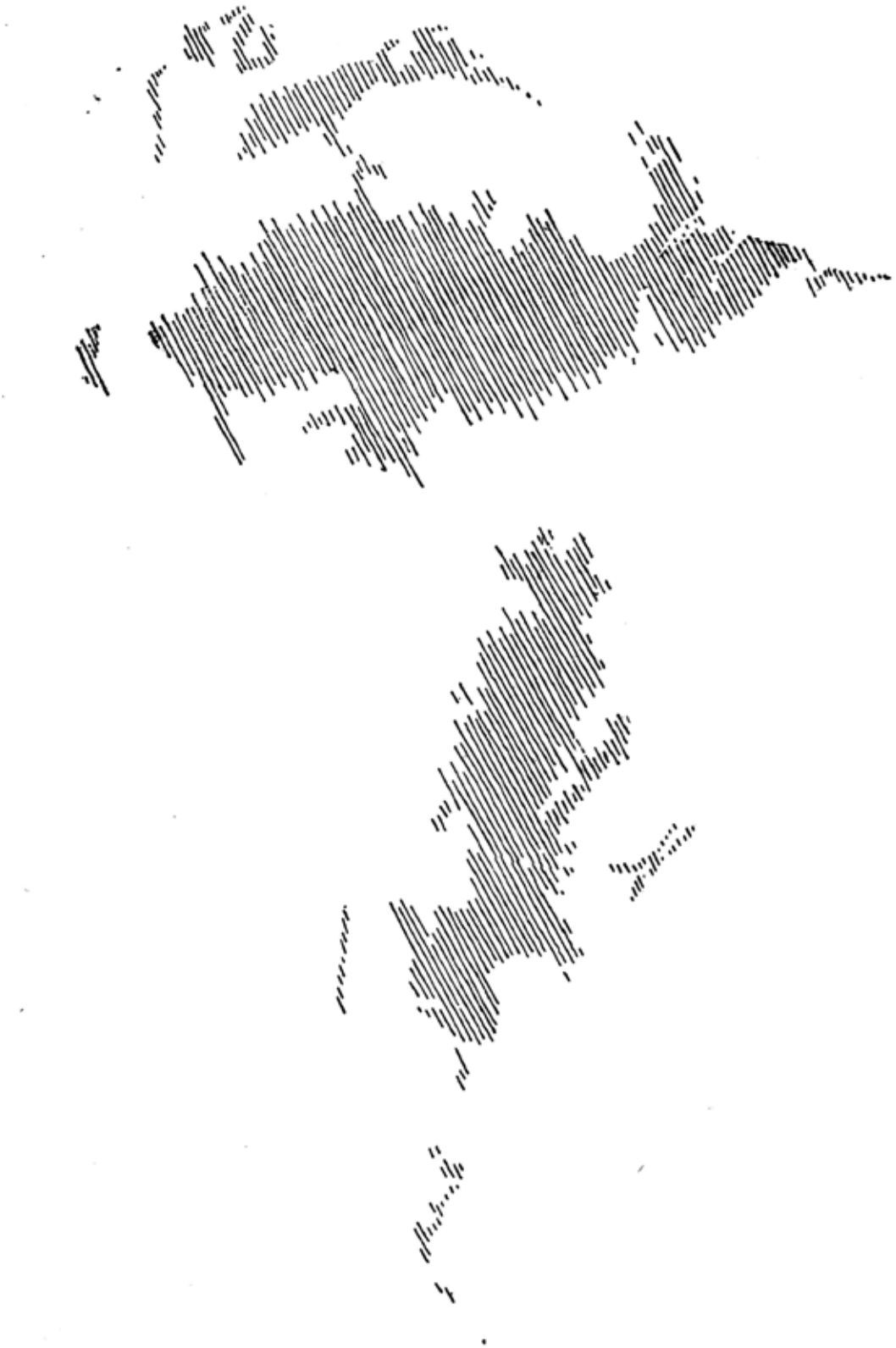


fig. 5. Mapping the Interior Sea. Source: Archivo Histórico José Vial Armstrong, EAD.PUC-Valparaíso.

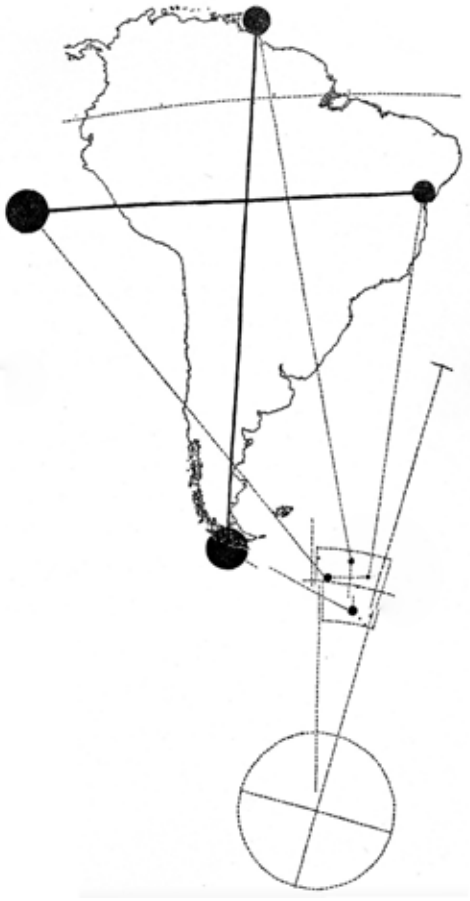


fig. 6. Inverted America of Joaquín Torres García, 1943. Source: Public domain, via Wikimedia Commons.

fig. 7. Inverted America in Amereida, 1967. Credits: Archivo Histórico Jos Vial Armstrong, EAD. PUCValparaíso.

ENDNOTES

①: The School of Valparaiso is referred to the School of Architecture and Design at the Pontificia Universidad de Valparaíso, Chile.

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PART III: COMMON GROUNDS

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Ground, namely 'the solid surface of the Earth', is an inescapable condition: whether it is a fertile setting for vegetation and fauna, a mineral layer, a stable foundation, a place to hide things, ground is there.

It records the activities taking place upon or, better yet, inside it. The recording process doesn't have to be intended as a passive accumulation, but rather a series of actions performed by the multitude of actors that form ground. In this perspective ground is intrinsically transformative and evolutive. The initial definition seems already inadequate: far from being a stable and solid entity, ground reveals itself as a ceaseless process wherein different bodies (Bianchetti, 2021) intersect, overlap, repel, resist, in other worlds a living soil (Puig de la Bellacasa, 2017). It is precisely in the multitude of bodies and their interactions that the sense of the common lies.

However, as the exploitative relations between humans and soils have grown stronger in the last century, many urban studies engaged in problematizing the relation between human settlement and the limits of the planet Earth, within the notion of *transition*. Nevertheless, the relation between urbanization and soil cannot be reduced to a mere process of soil consumption (Barcelloni Corte, Boivin, 2021). Here is no matter of quantifying to which extent planetary urban development is still possible, but rather to question how urbanization can affect the humans-ground relationship by producing new ecological relationalities and ethical orientations.

While the horizontal dimension of the ground, acting as a heterogeneous entity capable of connecting and putting in relation urban spaces (Secchi, 1986), remains relevant to design approaches and practices, additional concerns emerge as the ecological crisis intensifies. Living with the ground requires acknowledging its thickness and evolving condition. Indeed, ground also means *bottom, deep place*, a space of thickness that develops on vertical dimensions across times. Human beings live in this thick and moving space exchanging relations with other soil inhabitants: reformulating and building relationships is at the heart of the transition project.

The articles collected in this chapter, approaching the trope of urban transition through the notion of *common ground*, foster a reflection upon its thickness and transformative attitude. The relations between humans and ground are as tight as ambivalent. Repository of symbolic values and rituals related to fertility, life cycle, death celebration or city foundation since ancient times, the ground reflects and shapes the organization of territories on different scales: from the planetary dimension to that of matter.

The contributions of this chapter are assembled in a trans-scalar narrative reflecting the theoretical and physical scale of the topic: starting from

an epistemological reflection at the planetary scale, until the recognition of the techno-physical behavior of the soil as a veritable urban actor.

The first paper (Cantalini) initiates this interscalar narrative tackling the trope of the *planetary garden* and its etymology as a starting point for reflecting upon the contemporary global crisis (climatic, social, economic). Here the epistemological shift from the notion of *limit* towards the notion of *threshold* suggests new starting points to reflect upon the planetary garden as a veritable common ground for humankind. The two following contributions shift the focus to the regional scale of extractive operations. As shown for the Belgian Limburg region by Zani and for the Sardinian landscape by Simoni, post-mining territories, usually appointed for their state of decay and neglect, can be revelatory spaces for the observation of new post-industrial ecologies: environmental as well as social. From this perspective post-extractive territories constitute a fertile ground for fostering new spatial and theoretical reflections upon the transformation of human-soil relation through time. In the fourth paper, the elaboration of the new Urban Regional Plan of Bukavu (RDC) led Amani to reflect upon the role of urbanists and planners in the urbanization process of a sub saharan city where demographic pressure challenges the relationship between urban ground and its inhabitants. At the scale of an urban space animated by a panoply of spontaneous practices reflecting the variety and multitude of stakeholders involved, a technocratic approach is no longer viable: a systemic approach is needed that combines topographic and social environment for a sustainable transition. The last scalar shift is then propelled by the fifth paper of this section (Broggini). In the context of the European urban crisis, certified by new measures for land and soil conservation, the focus is shifted to the urban soil itself: rather than an infertile (physically and metaphorically) ground to be abjured, urban soil is presented as a proper urban actor, invested with its physical, historical, and cultural depth. The scalar shift corresponds here to a shift in posture inviting us to reconsider urban soil as a starting point for establishing new urban and territorial design perspectives.

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11 HORTUS IN-CONCLUSUS. DEMYTHOLOGIZING THE GARDEN

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For at least 10.000 years the garden has been the paradigm to think humankind's home on Earth.

Now that our house has become uninhabitable and our relationship with and within the world seems irrevocably in crisis, to which garden would we return? How to think it, build it, inhabit it? The purpose of this work is to deepen the understanding of this original *locus* where the figure of human inhabiting lies. Lost *ab origine*, the garden (as its etymology testifies, meaning enclosure) suggests a constituent inaccessibility, inseparable from the condition of the limit, a dialectic artifact at the crossroads of religion, architecture and law, capable of producing and maintaining the separation it enacts (inside/outside, self/other, nature/culture, etc.). Through an archaeological investigation to exhibit the 'prehistoric residue' hidden in the forms, concepts, techniques and appearances of the garden, the aim is to rethink the concept of limit proposing the inversion of the topology of the border into thresholds, zones of transition capable of exhibiting a still possible *lhabitus*: poetically inhabiting worlds.

11·1 THE LIMITLESS SPACE OF LIMIT

If it's true that the world can be rendered un-inhabitable when the relationship between man and space shifts (Tuan, 1990), or even worse "wears off" (La Cecla, 1988), the contemporary metropolis seems to provide the signature of the overlapping between ecological crisis and what could be called "crisis of presence" (De Martino, 1948), whose effects increase in intensity and intelligibility through the systemic insurgence of environmental crisis, climate change, natural hazards, pandemics, migratory emergencies, etc. Contemporary urban space in the era of globalization appears as a boundless, unlimited space without borders or edges (Koolhas, 2006); as such, conceptually and morphologically devoid of something as an Outside (Brenner, 2013). It has been inferred that the urge for global market to be unencumbered by any barrier or hurdle (may it be political, social, cultural, geographical, even climatical) ① would produce a uniform and continuous space (Branzi, 2006), whose 'smoothness' enhances the circulation and mobilization of flows (Castells, 2010), seemingly overcoming once and for all the dialectic between inside and outside. Even though the virtuality of flows should theoretically vanquish the very conditions of the most potent concept and policy of modernity, namely that of borders (Zanini, 1997), what unfolds in reality is quite the opposite: as observed and pointed out by many authors ●, eventually globalization has led to a massive fortification of physical space, causing an unprecedented proliferation of space-control technologies and security devices: borders, barriers, walls, enclosures, red zones, etc. These dividing, filtering and linking topographies produce what can be referred to as a "partitioned spatiality" (Marcuse, 1995): metropolitan space can be described as a new frontier zone (Sassen, 2015), crisscrossed by countless rifts and fracture lines (De Cauter, 2015) resulting in a discontinuous and fragmented space that makes it appear as uniform and continuous (Petti, 2007). Borders, in their true connotation as both finis, the settled borderline of an inside, and limes, the mobile frontier zone of an innerness that progresses outwards ●, instead of faltering, multiply, overlapping and blurring with each other ④. What globalization unfolds as a cartographical crisis of space (Farinelli, 2003) and as the collapse of Western nomos as "order and orientation" (Schmitt, 1991) could be considered as a crisis of the Outside: the inherent incapability of thinking something outside of itself such as openness or otherness. The original feature and form of the metropolis would thus result intelligible in the 'state of exception', from the Latin compound verb ex-capere, literally meaning 'seizing, taking outside' (Ernout, Meillet, 1959), a spatial and political apparatus that utterly internalizes and includes the Outside in the form of its exclusion: where "exception becomes the rule" (Agamben, 2004), territories are placed outside normal order and yet cannot be referred to as external spaces ● [fig. 1]. To engage the challenges of our time, urban and landscape designers committed to tackle political, humanitarian and ecological predicaments turn to the garden. In fact, city and garden are dimensions politically, symbolically and technically akin to each other – or, as it has been suggested (Corrado, 2020), are actually the same thing: the form of human dwelling and its problematic relationship with nature, otherness, diversity. Gardening, as such, is a metaphoric inference that made us

understand "what a city can be" and it is not simply the hidden material assumption of the city, but rather "its formal model" (Coccia, 2020). Hence, the urgency to question and "rub against the grain" (Benjamin, 1977) the original locus where lies the inhabiting figure of mankind: the garden, in its twofold meaning of architectural and political paradigm (Clement, 2012). The imagery of garden can be harnessed to rethink and explore the "lines of flight" (Deleuze, Guattari, 2017) of the key element of this topology: the limit.

11·2 THE PREHISTORIC GARDEN

According to the French gardener and landscape designer Gilles Clement, "the first enclosure is a garden" ● and its appearance would correspond with the end of mankind's nomadic lifestyle ●. The necessity of taking possession of a place, settle down (Rykwert, 2002), the development of the symbolic and material technologies to domesticate the living (Laureano, 1993), to enclose the outside in an inside (Carrieri, 2022) would be testified by the dense and widespread etymology that has handed down to us the concept of garden. The word 'garden' comes from the French jardin, diminutive of jart, that stands for 'vegetable garden', in turn derived from the Franco-Germanic gard/gart, 'fence', 'hedge', relating to the Indo-European root *gher-, literally meaning 'to enclose, encompass'; it is also related to the Latin word hortus, equivalent to the Greek χόρτος, derived from the Indo-European lemma *ǵ hortós, translatable as 'enclosure', 'fence'; lastly, the most fortunate vocable in Western political imaginary: 'paradise', from the Latin paradisus, borrowed from the Greek παράδεισος and imported by the historian Xenophon from the Avestan word pairidaeza, literally 'earthly enclosure' (pairi, meaning 'around', and daeza, 'wall of unbaked bricks' ●), which later came to depict the grand hunting grounds of Persian semi-divine kings ●. Garden therefore seems to share some kind of relationship with the topology of limit: our aim is to question this peculiar intertwining passed down in tradition, where it appears the possibility of something as a border, meant as a material and symbolic construction at the crossroads of religion, law and architecture. 'Limit' comes from the Latin limus ⑩ and is strictly related to the founding rituals of ancient world cities, consisting in the occupation of land and the fixation of precincts (constitutio limitum) through the rite of limitatio ⑪. This ceremony consisted in the ploughing of the soil as an original act of spatial measurement, definition, separation and collection of both living and non-living beings ⑫, a sovereign act of divide ⑬ where all entities are given a name and framed in their place one next to the other ⑭. Its ancipital nature provides and ensures the effectiveness of simultaneously dividing and binding (Simmel, 1997), enabling to separate and manage this separation (Fabbri, 2020). The establishment of a binary configuration is essential to arrange and organize space, making it traversable and inhabitable under certain conditions, placing it out of common usage (Ruskin, 1982). If we assume that gardening stands for enclosure and domestication ⑮, founding a city can therefore be thought as making a very specific form of garden, and every foundation of a city enacts and reproduces an 'original gardening gesture' ⑯ [fig. 2].

If such premises are true, the garden would name a form of relationship with the world, a field of forces where the figure of human inhabiting is entangled in a polarization between inside and outside, culture and nature, same and other, human and non-human (Roger, 1997). This posture, circumscribed by the binary structure of limit, would prove as a constituent moment where something as an institution becomes thinkable (Schmitt, 1991) ⑰: establishing limits, it assures its founding functioning through the seizure and articulation of the exteriority it has performed (Thomas, 2022), dialectically progressing onwards between a 'no more' outside and a 'not yet' inside ⑱. Consequently, the garden's manifestations and representations throughout history retain the fossil record of a primordial scission: the vestigium of a natural condition of in-division, lost forever and unattainable to experience, on which the concept of enclosure itself is negatively founded ⑲. This original condition of openness is captured inside the mythologic machinery of limit that dismisses it in an extra-historic dimension, suspended and withheld between a 'no more' and a 'not yet' (Agamben, 2019), in the form of a dis-location in an unfathomable past beyond accessibility ⑳. The founding gesture enacts a spatial division and temporal caesura that irremediably locate the garden in an inaccessible dimension. To archaeologically access to the garden means therefore not a quest for a purer archetype, a more authentic origin, but the endeavour to unground and access a "prehistoric residue" ㉑, an inner principle inside history awaiting redemption. Prehistory is not to be hypostatized as a past event, but as inherent, coexistent and heterogeneous deviance in history: it is not something ancient or lost to the ages, that occurred once and for all in illo tempore, but an operative force still taking place here and now (Benjamin, 1977). The stake is that such a latency is the threshold nature of the garden, spatiality capable of interrupting and suspending the topography of the limit, unveiling its intrinsic liminality as an erratic zone of passage, un-divided and un-limited ㉒.

11·3 GARDEN AS THRESHOLD

'Limit' has yet another meaning, "that etymology must not overlook" (Benjamin, 2002). In fact, Latin possesses another word to name limits: limen. Descending from the same root as limes ㉓, limen meant a very specific concept – the outcome resulting from the raising of the ploughshare during the rite of limitatio where a gateway was to be built ㉔. Limen, irreducible from limes, is the residuum of the suspension of limitatio, a discontinuance in the ploughing, an uncertain zone neither trench (sulcus), wall (murus) or gate (ostium): a threshold. Where the furrow of the vomer marks a continuum that institutes a dialectic apparatus, the threshold signifies an interruption, an integrally profane sphere. If it's true, as it has been speculated, that the word 'space' comes from the verb pateō, 'being opened, accessible' (Ernout, Meillet, 1959), threshold can suggest the existence of a residue of open space, a fragment of un-determined and un-limited land captured and hidden inside the machinery of ostium, the gate, and limes, the border. Literally wild and uncultivated, this residue is not an unattainable past, but an actual urge always accessible, embedded

within the limit, restrained and withhold by the fixture [25]. Bringing an halt to the mythologem of enclosure means not to design new, more opened limits or ways to trespass them – as it would guarantee their functioning [26] – but to destitute limes and exhibit limen. Threshold does not revoke limits but makes them inoperative: it is a gesture of 'profanation', intended as a particular form of negligence towards something that was separated, restoring it to common use (Agamben, 2005). Amidst of an unsolvable polarization, threshold calls forth an "insuperability of contradictions, their tensioning: not a synthetic process, but a dialectic in standstill" (Pelilli, 2016), a cosmological gesture (Meschiari, 2018) that interrupts and deactivates the operating dichotomy of the limit. Within thresholds, antithetical couples, far from founding each other mutually, come into touch, fall together without mediation: what flashes in this interruption is a "dialectical image" (Benjamin, 1977), a detournement that exhibits and deactivates the mythologies of space and opens it to new potentialities (Jesi, 2013). Neither inside nor outside, but in medium, 'between', thresholds bring about a pure transition (Van Gennep, 2012) "betwixt and between the positions assigned and arrayed by law, custom, convention and ceremonial" (Turner, 1977). Demythologizing means to deactivate the operativity of limits and return them to their liminal, transitional nature, an inseparable experience of space that appears to escape the very concept of enclosing. If the garden, in his historical manifestations, retrieves and represents an original scission – the production of space, nature and culture, etc. – it nevertheless withholds at the same time an inseparable in-between scoria, a prehistoric, nomadic and liminal tertium datum: a threshold, a zone of un-locked and un-limited transition – the Outside [fig. 3]. The garden is humankind's dwelling place because it names the pure taking place of the ever-mutable, transitional and experimental technic relationship with and within the Outside: it calls forth the inseparability of space and its use without end. Gardening requires to be enacted, performed in place to hijack borders and overturn them in thresholds: tracing, recognizing and liberating emergent environments where encounters with otherness can take place (Stavrides, 2019) are unedited practices to access "spaces that can be exclusively crossed-and-inhabited, and never occupied, and therefore cartographically mapped" (Giaccaria, Minca, 2012). Demythologizing means delegitimating every founding pretence 'on the ground', to resolutely situate within the gap of the limit: it means to experience it in a ludic dimension [27], designing 'lines of flight' to make accessible, once more, the Outside. If gardening truly names a specific form where a multiplicity of techniques, know-how, beliefs, desires, affections – in other words, a cosmology – is experimented and inhabited inseparably in place [28], it could be envisioned as the poetic habitus that fosters to desecrate and destitute borders to overturn them in thresholds, as a project to access hic et nunc that errant ethics capable of finally inhabiting 'inside an Outside'.

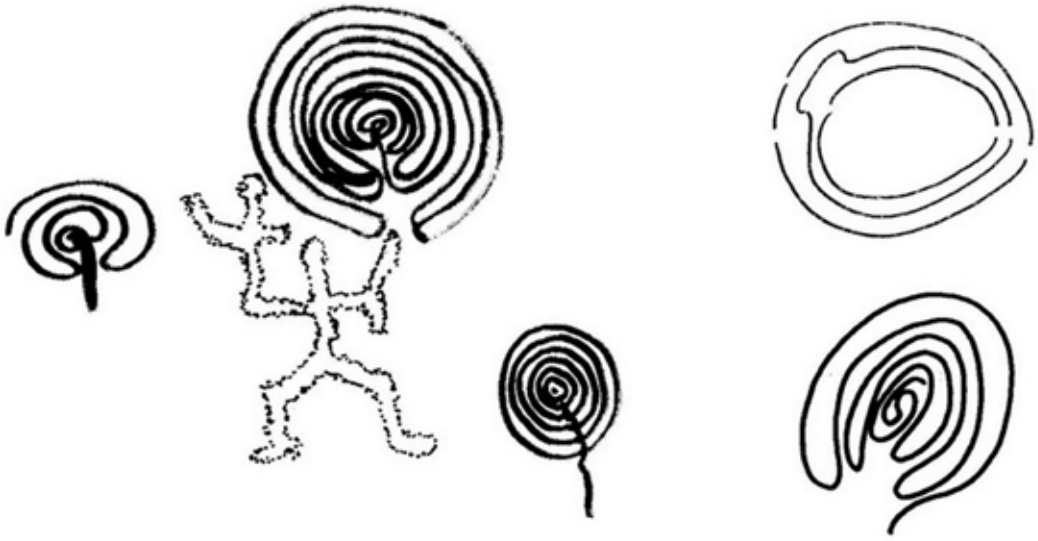

fig. 1. Dwelling within exception: the refugee camp of Shousha, Tunisia. The tent, provisional and temporary shelter, conveys its permanent condition through garden plots awing the entrance. Credits: Wildshut, H. (2019) Rooted, [photography], http://www.henkwildschut.com/work/gardens/photos-phosphate-gardens/ [accessed 16/01/2023]

fig. 2. "In the beginning was the fence" (Trier, 1942): cave graffiti depicting 'domestication enclosures' and 'neolithic villages'. These structures were made up of one or more ditches engraved in the soil. Archaeologists think that these trenches were not originally defensive precincts, and they could be interpreted as means – long known to palaeolithic hunter-gatherers – to organize, harvest humus, collect atmospheric humidity, gather pollens, practice gardening, shelter the herds, etc. The symbolic and technological devices employed are akin to those later adopted and repurposed in ancient cities foundation rituals. Credits: Laureano, P. (1993), Giardini di Pietra, Torino: Bollati Boringhieri, [drawing].

fig. 3. Carlo Scarpa, gardens of Università Iuav in Venice. The door, placed horizontally and filled with water, cannot be closed, opened or crossed, it neither divides nor draws a relationship between two heterogeneous places, but becomes itself a place. Neither inside nor outside, it is a threshold leading nowhere. Avoiding every distinction, determination or mediation, it appears as an erratic zone of interruption. Transition just takes place, happens and eventually becomes, one more time, possible here and now. Credits: https://www.penccil.com/museum.php?show=11070&p= [accessed 16/01/2022]

ENDNOTES

①: Cfr. Vegetti, M. (2010), L'invenzione del globo, Torino: Einuadi, pp.139-145.
●: We refer here to: Augè, M. (2007), Tra i confini. Città, luoghi, interazioni, Milano: Mondadori; Castells, M. (2010) The rise of the network society. Chichester, West Sussex: Wiley-Blackwell; Giaccaria P. and Minca, C. (2012), Geografie della soglia, in: Ponzi, M. and Gentili, D. eds., Soglie. Per una nuova teoria dello spazio, Milano: Mimesis, pp. 47-60; Marcuse, P. and Van Kempen, R. eds. (2002), Of States and Cities. The Partitioning of Urban Space, Oxford: Oxford University Press; Petti, A. (2007) Arcipelaghi e enclave. Architettura dell'ordinamento spaziale contemporaneo, Milano: Mondadori; Sassen, S. (2015), Old borders and New Bordering Capabilities. Cities as Frontier Zones, Scienza Politica, XXVII(53); Weizman, E. (2017) Hollow land: Israel's architecture of Occupation. London: Verso.
●: Cfr. Sordi, M., (1987) Il confine nel mondo classico, Milano: Vita e pensiero, pp. 2-5.
④: Cfr. Gentili, D. (2008), Confini, frontiere, muri, Lettera internazionale, 98(4), pp. 1000-1003; Zanini, P. (1997), Significati del confine. I limiti naturali, storici, mentali, Milano: Mondadori, pp. 55-59, 127-132.
●: For an overview on the notion of 'state of exception' and its relation to urban topography, cfr. Agamben, G. (1995), Homo sacer. Il potere sovrano e la nuda vita, Torino: Einaudi; Agamben, G. (2004), Stato di Eccezione. Torino: Bollati Boringhieri; Cavalletti, A. (2005), La città biopolitica: mitologie della sicurezza, Milano: Mondadori.
●: Clément Gilles (2012) Breve storia del Giardino. Macerata: Quodlibet, p. 17, Eng. tr. of the author. Clément develops further this essential link, especially in his 'planetary garden' concept: since garden means enclosure, Earth, as a finite and fragile system where life communicates and intermingles, can be ecologically represented and thought of as a garden. "From now on", he argues, "garden is placed within the limits of the biosphere. This is the new enclosure" (Clément, G. (2015), Life, Constantly Inventive, in The Planetary Garden and other writings, Philadelphia: Pennsylvania University Press, p. 80), thus broadening and harnessing the imaginary of garden to foster ecological thought and design to address contemporary urgencies. Limits (as field of action and responsibility, biological depth, intermingling space of the living, etc.), throughout Clément's humanist-environmental thought, are a fundamental aspect that must not be overlooked. Cfr. Giometti G. and Orazi M. (2006), L'ordine del paesaggio, Domus, 890; Roger, A. (2011), Dal giardino in movimento al giardino planetario, in Clèment, G., Il giardino in movimento, Macerata: Quodlibet, pp.167-174).
●: Ibid., p. 17. It is suggested now by archaeologists, anthropologists and researchers that gardening techniques (such as knowledge of plants and animals' life cycle, vegetal alliances, water supply, seed conservation, growing rhythms, selection for medical and psychoactive properties, harrowing, fertilization, etc.) were already known and widely employed long before sedentarism as part of the wide-spectrum sustenance means of

hunter-gatherers and nomads. It is even speculated 'sedentarism' was in origin nothing more than a set of temporary techniques employed under environmental or symbolic circumstances that eventually became permanent, although fragile. Cfr. Scott, J.C., (2017), Against the grain. A deep history of the earliest states, New Haven: Yale University Press.

●: Cfr. Khosravi, H. (2014) Camp of Faith: On Political Theology and Urban Form, Ph. D., TU Delft University, pp. 71-76. Khosravi's states in his work that daeza has not a defensive meaning, but literally signifies a 'divider of space': only through an act of limitation and separation can space be produced.

●: For the etymologies proposed here cfr. Carrieri, A. (2022) Urban Eden: Giardino, città, utopia. Milano: Mimesis, pp. 22-28; Chantaraine, P., (2009) Dictionnaire étymologique de la langue grecque, Paris: Kliencksieck, p. 1270-1271; Lincoln, B. (1982), The House of Clay, in Indo-Iranian Journal, vol. 24, 1, January 1982, Leiden: Brill Publishers, pp.1-12; Ernout, A. and Meillet, A. (1967) Dictionnaire étymologique de la Langue Latine. Paris: C. Klincksieck, p. 535; Mallory, J.P. and Adams, D.Q. (1997) Encyclopedia of Indo-European culture. London: Fitzroy Dearborn, pp. 220-232.

⑩: Cfr. Ernout, A. and Meillet, A. (1967) Dictionnaire étymologique de la Langue Latine. Paris: C. Klincksieck, p. 640.

⑪: Cfr. Rykwert, J. (2002), L'idea di città, Milano: Adelphi, pp. 145-155.

⑫: Cfr. De Sanctis, G. (2007), Solco, muro, pomerio, in Mélanges de l'École française de Rome. Antiquité, 119(2), p. 520; Laureano, P. (1993), Giardini di pietra, Torino: Bollati Boringhieri, pp. 48-49; K. Schmitt (1991), Il nomos della terra, Milano: Adelphi, p. 54; M. Serres (1994), Le origini della geometria, Milano: Feltrinelli, p. 38-43.

⑬: De Sanctis, G., (2015) La logica del confine. Per un'antropologia dello spazio sacro romano, Roma: Carocci, p. 163; Serres, M. (2021), Il libro delle fondazioni, Milano: Mimesis, pp. 258-259.

⑭: Foucault, M. (1973), The Order of Things, An archaeology of the Human Sciences, New York: Vintage Books.

⑮: ICfr. Aureli, P. V. and Giudici, M. S. (2019), A concise history of Gardens, in Accattone, 6, Brussels: Sophie Dars & Carlo Menon, p. 222.

⑯: Cfr. Coccia, E. (2020), Common nature. Beyond the City and the Forest, in Vesper, 3, Macerata: Quodlibet, p. 100. As the author stresses: "A garden is therefore rather a political object than a biological one […] it is the original nucleus from which every city can develop. […] In fact, just like a garden, every city is born from the collection and separation of a heterogeneous set of living beings. Agriculture and gardening are not simply the hidden material assumption of the city: they are rather its formal model" (Ibid.).

⑰: Institution is here used in the meaning of «non seulement les institutions classiques du droit, du gouvernement, de la religion, mais aussi celles, moins apparentes, qui dessinent dans les techniques, les modes de vie, les rapports sociaux, les procès de parole et de pensée», a set of knowledges and practices that, setting boundaries, guarantees its effectiveness on reality. Cfr. Benveniste, E. (1969), Vocabulaire des institutions indo-européennes, I. Paris: Les Éditions de Minuit, p.9-10; Thomas, Y., L'artificio delle istituzioni, in: Thomas, Y. (2022), Il valore delle cose, Macerata: Quodlibet, pp. 69-74.

⑱: Cfr. Luzi, F. (2022), Attraversare il limite. Per un pensiero della soglia, Ph. D., "La Sapienza" University of Rome, p. 118.
⑲: Cfr. Chiffoleau, J. et al., (2020), L'istituzione della natura, Macerata: Quodlibet, pp. 29-30; Vazquez Pizzi, D. (2013), Il nomos della terra? In principio erano i commons, in Crios. Critica degli ordinamenti spaziali, 2 (2013), Milano: Franco Angeli, pp. 35-37.
⑳: In Western theological-political thought it is only due to the exile from the Garden of Eden, lost ab origine and forever delayed in the future, that the experience of historical time (saeculum) and geographical space (mundus) is founded. If it's true, as Evans speculates that "the holy alliance between architecture and religion is more than just historical" (Evans, R. (1995), The projective cast. Architecture and its three geometries, Cambridge: The Mit Press, p.319) and Khosravi stresses that "architectural history is not separated from the history of power and religions. All significant architectural concepts are secularized theological ideas" (Khosravi, H. (2014) Camp of Faith, Ph. D., TU Delft University, p. III), the garden always names this founding and unattainable indivision, whose scission is overseen and guarded by the apparatus of limit, as a zero degree in the separation and seizure of beings, things and places. Cfr. Luzi, F. (2022), Attraversare il limite. Per un pensiero della soglia, Ph. D., "La Sapienza" University of Rome, pp. 14-15.
㉑: Benjamin, W. (1997) Sul concetto di storia, Torino: Einaudi.
㉒: Cfr. Vazquez Pizzi, D. (2013), Il nomos della terra? In principio erano i commons, in Crios. Critica degli ordinamenti spaziali, 2 (2013), Milano: Franco Angeli, pp. 35-37.
㉓: Cfr. Ernout, A. and Meillet, A. (1967) Dictionnaire étymologique de la Langue Latine. Paris: C. Klincksieck, p. 639.
㉔: Cfr. Rykwert, J. (2002), L'idea di città, Milano: Adelphi, pp. 145-155.
㉕: Cfr. Luzi, F. (2022), Attraversare il limite. Per un pensiero della soglia, Ph. D., "La Sapienza" University of Rome, p. 142.
㉖: Cfr. Agamben, G. (1995), Homo sacer. Il potere sovrano e la nuda vita, Torino: Einaudi, p. 95.
㉗: Gardening, as form of relationship with non-human beings and territories, is not exclusively an economical and productive practice; appeared long before sedentism, it has been suggested that gardening would prove incomprehensible if one doesn't assume the perspective of its deep entanglement in a ludic, recreational and symbolic dimension. Far from being a destiny in human progress, agriculture and enclosed gardens should be regarded as specific, temporary and not irreversible forms of relation to a world. Cfr. Laureano, P. (1993), Giardini di pietra, Torino: Bollati Boringhieri, pp. 45-47; Scott, J. C. (2017), Against the grain. A deep history of the earliest states, New Haven: Yale University Press, p. xi, pp. 10-11.
㉘: Assunto, R. (1988), Ontologia e teleologia del giardino, Milano: Guerini e associati, p. 28.

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12 MIGRATING FORESTS. ON THE ECOLOGIES OF MINING LANDSCAPES IN LIMBURG, BELGIUM

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Following the social and economic struggles related to the phasing out of the coal industry in the 1960s, former mining settlements across Europe have been often stigmatized as 'decaying' worker's suburbs.

In the context of the Belgian Limburg, scholars have traditionally approached these settlements (also called *Citées* – singular *Cité*) from the perspective of large-scale political and ideological constructs. However, by keeping on reading mining landscapes from this perspective, the current economic decline will continue to be associated with narratives of 'disruption', defined against a perceived 'glorious' industrial past. This research, builds on the other hand, on the idea that such a perspective have prevented the reading of other minor-scale 'unfixed' livelihoods that equally contributed to articulating the mining territory – i.e. the lives of migrant workers, the buildings where they were housed, or the industrial forests that surround the settlements. Specifically, in this paper I propose that mining landscapes can also be regarded as expression of intense human and non-human migrations that have articulated innovative ecological relations. Such ecologies, I further posit, precisely because emerging from intense migration phenomena needs to be contextualized within wider geographies, but also have very specific features. Therefore, by tracing human and non-human migration movements I attempt to construct a more inclusive reading of various environmental, social and technological concerns that define mining landscapes. In particular, in this paper I will focus on how the extraction of material from the subsoil and its disposal on the surface through mining and other industrial endeavours, have also created favourable conditions for the spreading of abandoned industrial pine forests. With this work I aim on the one hand, at stressing the agency of various minor-scale Others within the historicization of mining landscapes while offering, on the other hand, a methodology that can disclose renewed conceptualizations of (post-)extraction landscapes also as fertile grounds for renewed ecological thinking.

12·1 INTRODUCTION

In my dissertation, the reading of minor-scale histories of migration forms the base for a revision of various dominant narratives that are traditionally associated with mining landscapes. This means to shift from readings that are limited to economic growth and decay while offering a more relational and systemic perspective. More specifically, I focus on the 7 coal mining settlements that developed around the city of Genk in the Belgian region of Limburg. Genk is mentioned to be, before the discovery of coal in its subsoil, a small pre-industrial hamlet whose surrounding sandy heathlands and wet valleys mainly allowed for an agriculture of subsistence (Monkhouse 1949). Yet in 1847, the 'Royal Reclamation Act' worked to define a base for communal land dispossession and increase the national economic productive base. In 1901 the discovery of coal, sparked a so-called 'coal rush', transforming Genk into one of the largest industrial centres of Belgium. The 1950s marked a peak in the extraction of coal when in 1956 were extracted around 10 million tons of coal between the seven mines of Limburg (Eisden, Waterschei, Zwartberg, Houthalen, Zolder and Beringen). However, these large movements of earth and the extraction of substantial amounts of coal from the subsoil were mainly performed through the labour of an increasing number of people that migrated to the settlements as 'guest-workers'. Starting from 1946, a series of international agreements with countries such as Italy, Spain, Morocco, and Turkey officialised migration chains. Contracts for 'guest-workers' were however imposing relatively unstable working and housing conditions (Cumoli, n.d.). Today, after the closing of the mines between 1962 and 1992, the mining settlements of Genk face a growing stigmatization of 'decaying workers suburbs', that builds on the idea of a diffused post-industrial social 'malaise' and environmental 'disruption'(Verbeken 2013).

The consequences of the decline in the mining industry, that historically have represented an almost univocal driver of territorial development, is often considered as extending far beyond the problems associated with the loss of 20.000 workplaces. Following this line, academic research on Limburg have always assumed the standpoint of various political and ideological constructs (De Meulder et al. 1999; Smets 1977; Loeckx and Smets 1991). More recent studies have also stressed the role of large infrastructural projects in shaping the physical and spatial structure of the region, through what has been defined as an 'implicit' urbanization process (Ryckewaert 2011). Although these studies have been giving a large emphasis on the role of politicians, bureaucrats, and technicians, this has excluded an historical perspective on more diffused and ordinary actors, therefore precluding the possibility of accounting for processes that happened more on a 'small' scale.

Scholarships in urban studies and history have in this sense, long been stressing the necessity of finding more adequate descriptive tools, methods and visions to better understand such post-industrial landscapes (Viganò 2015). Conversely, the construction of a profile of these territories has been progressively opened to an understanding of precise social characters that are specific to mining landscapes. Some scholars have concentrated as a consequence, on inserting global ideological and political issues

within the specific class and gender conditions of mining towns, accounting for the influence that the previously marginalized agency of labour and gender relations had on the spatial organization of these urban spaces (Crawford 1995; Massey 1995). Nonetheless, in this context, the question of the intense human and non-human movements that accompany modern industrial growth, are often limited to a matter of displacement and industrial exploitations. Seen from this position, the decline of the economy and the associated social and material 'ruination', continue to sustain the idea of a post-mining 'broken' condition.

12·2 A LANDSCAPE OF MIGRATIONS – TOWARDS A PLURAL UNDERSTANDING OF EXTRACTION LANDSCAPES

On the other hand, in this work I propose an alternative understanding that builds on the idea of an 'ecological pluriverse' emerging from more recent stands in post-colonial and nonhuman conceptualizations of cities (Gandy 2022; Stoetzer 2022). Here, scholars have argued for opening architectural histories towards 'natural processes', moving to more 'grounded' methodologies and moving away form more traditional 'pathologizing approaches' that identify post-industrial communities as 'broken' (TenHoor and Varner 2022). Thus, through this work, I explore how the underlying historical character of mining landscapes is not only determined by large-scale economic and political concerns, but also by the lives of those people who migrated as 'guest-workers, by the structures they inhabited (initially intended as 'temporary' but often shaping the everyday of many inhabitants until the mine closure), and by the spreading of former industrial forests that are today surrounding the settlements. The ensemble of such conditions of mobility I argue, can be regarded as forming a Landscape of Migration with important methodological and theoretical implications. Following this line, I argue that mining landscapes can be regarded as expressions of multiple human and nonhuman migration movements, articulating innovative ecological relations. These ecologies, precisely because they are determined by intense migration phenomena have important specific features, that nonetheless contextualize these landscapes within wither geographies. This means, methodologically speaking, exploring how multiple social, technological, and environmental concerns can be read within mining landscapes by tracing migration trajectories and their intersections. More specifically, in the following passages of this contribution, I look at how the extraction of material from underground – and its disposal above ground – is entangled with the lives of those who inhabited the 'marginalized' spaces of the mining Cités, and the lives of former industrial forests that were introduced in the region for the exploitation of mining wood. Thus, I question how the ecological relations emerging from these livelihoods can unsettle various dominant narratives of 'improvements', which form the base of industrial modernization and still influence various contemporary governmental initiatives.

12·3 SHAPING IMAGERIES ON LIMBURG

An important aspect that concerns studies and historiography on mining towns is their recurrent association with detractive and unfavorable environmental imageries. In the specific case of Limburg, an image of the region as that of a 'dumping territory' (Loeckx and Smets 1991) where to locate activities far from more densely inhabited urban centres, is present from the pre-industrial development of the region. Thus, such an image has long since produced a stigmatization that grew parallel to the decline of those political and ideological constructs that have previously sustained their demographic and urban growth. On the other hand, with this contribution I look at how the extraction of material from the underground – and the 'dumping' of such materials as industrial waste – is also entangled with the ecologies of former industrial forests and the growing fertility of the land.

In the second half of the 19th century, state-driven narratives of capitalist expansion have also worked to construct an image of Limburg as a 'deserted wastelands'. Here, the conceptualization of the region as a 'void', along with its symbolic and cultural meanings, served as a tool for land dispossession. By rendering the sandy landscape of the region as an 'underdeveloped' frontier, such narratives sustained large-scale expropriation campaigns and what the government named as "la mise en valeur" (or the improvement) of Limburg that was formalised in the act of 1847. Thus, the transformation of the region into a profit-making territory, materialized through large afforestation projects for wood production. Conifers were the only tree that could be grown profitably on these sandy soils, and therefore Scots Pines and Corsican Pines were introduced as resources for producing mining props.

However, the pre-industrial heathlands of Limburg also attracted the positivistic interests of the Belgian urban elites. Seeking healthy open spaces, both artists and scientists repeatedly travelled to Limburg, that appeared in numerous paintings, leaflets and postcard. A campaign launched by a group of artists even arrived to depict Genk as a 'pays du reve' (or dreamland in English) ①. Within the materials produced by this group of artists and scientists, the photographs taken by the Brussels botanist Jean Massart show in this sense, how the heather landscape had a central role in providing the organic material at the base for land fertilization, through which the region's inhabitation was rendered possible. The pre-industrial Limburg heathlands were already deeply marked by intense material movements, where their 'maintenance' happened through the disturbances that accompanied rural practices of sustenance. Yet, the opening of the first mine in 1917 came with other drastic changes. The controlled space of the garden cities materialized through the companies' need to provide housing for labourers, while dealing with the environmental and social effects of mining exploitations. While the 'blossoming' gardens of the mining towns were celebrated with pride (Adam 1924), the induced fertility of the land was in fact mainly realised through the extensive use of cheap fertilizer. Ammonia, a by-product of coal gasification, and metal slag from the steel industry, assumed here a central role ●.

12·4 MIGRATING FORESTS

Extracted materials such as clay, sand and wood were also accumulated in large mining dumps (called Terril), that still constitute one of the most prominent environmental traces of mining exploitation. Waste dumps were re-mined many times and in many different ways, but often interacted with the life of those who inhabited the margins of the settlements. Mining scrap was often reused for producing construction blocks of composite material, in the building of housing for the growing population. Yet, other 'minor-scale' practices that certainly had less visible territorial impacts than their parallel industrial-scale operations, can also be seen in contributing to shaping the lived experience of those who inhabited the most 'marginalised' parts of the settlements ●.

With the 'coal crises of the 1960s, economic de-growth took over large parts of the mining towns. In the midst of Fordist ideals, the first shopping mall of Belgium was built here, following an imported American model (Gosseye 2018). Moreover, the opening of a Ford production plant in the southern part of the city, further projected the region into the global market's logic, making its economy more and more dependent on external resources and gradually detached from its local dimension. The response of planning to the economic decay of these towns has often been that of erasure. Re-creating a condition tabula rasa to increase land value while ignoring issues of identity and the existing social and ecological reality.

In this period, the request for timber also stopped expanding, and the industrial forests quickly lost their profitability falling into disuse. Here, many of the trees favourably met the new soil conditions that emerged as an unintended outcome of the capitalist development of the region, where the fertility of the land grew hand in hand with mining exploitations. Today, these forests are gradually reclaiming space through a rich and complex entanglement of human and non-human actors. Where categories like derelict or ruins are still used to define the spaces that surround the mining towns of Genk, a wider understanding of how mining exploitations have articulated the landscape cannot be fully understood if not by reconnecting the traditional notion of extraction with its opposite idea of insertion on the territory. Meaning that, the landscape that is 'created' and the one that is 'exhausted' necessarily need to be understood as part of the same material and conceptual process.

Environmental initiatives are today mostly concerned with the 'fixation' of portions of an ecosystem that supposedly occupied the vast majority of the land in pre-industrial times. Heathlands, resulting from the medieval over-exploitation of the forests, are today preserved through the enactment of continuous and well-balanced disturbances. Old heather is cut, dead lives and fertile soil displaced, and trees removed. This is happening however, not without intense protests from the local inhabitants. Efforts from local environmental agencies are here particularly concerned with the removal of trees moving from the surrounding abandoned industrial forests. As these forests are not older than 50 or 60 years, and have since decades lost their economic value, volunteers carry out large scale clearings, to enhance the preservation of the pre-industrial heather landscape.

However, despite their decay in economic value, these forests still retain important positions for inhabitants, that invest them with a variety of meanings and uses. The green spaces within and without the town, are today recognized as a great source of value and emotional attachment. Despite nativist ideas of 'landscape originality' that often threaten their clearance, they still mark imageries and the environmental reality of these mining settlements, beyond the juxtaposition of unproductive 'wastelands' and 'blossoming' garden cities. The forests surrounding the mining settlements of Limburg allow us to reconnect the image of mining landscapes as highly technocratic environments, with the idea of their obsolescence and decay. Looking at how migration movements have also made them as places where relations emerge from mutual sustenance rather than unidirectional exploitations. Here, such ecological relations through their cosmopolitan but highly specific characters (Gandy 2022), can foreground important forms of cohabitation that are capable of unsettling the organizational logics forming the base of both past industrial modernization and many contemporary governmental agencies. In this sense, mining landscapes and their post-industrial spaces, despite current economic decline are here reframed as much more than simple sites waiting to be erased.

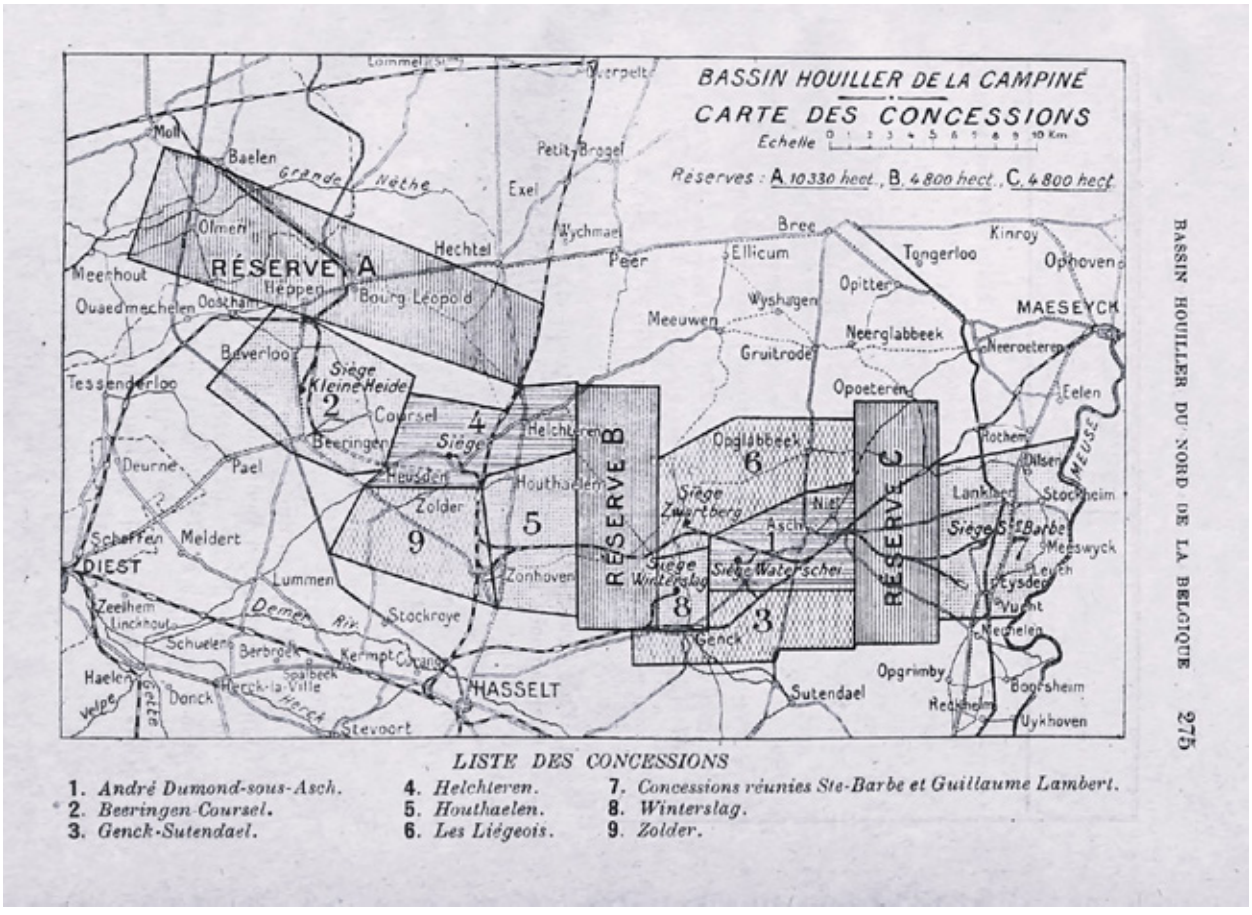

fig. 1. Drawing of the mining concessions in Limburg. Credits: Annales des mines de Belgique.

fig. 2. Former housing for ‘guest-workers’ in Waterschei before demolition. These structures were realised with pine wood from the pine forest in the background. Credits: Heemkring Heidebloemke.

fig. 3. One of the photographs taken by the botanist J. Massart. A closer look shows a man collecting heather with the mining pits of Waterschei in the background. Credits: Notteboom.

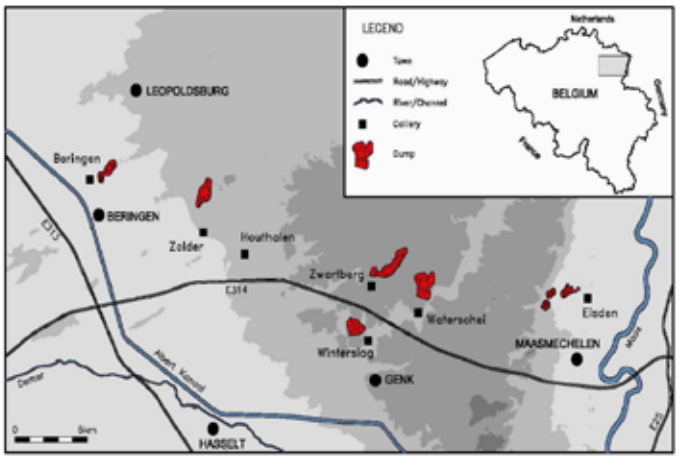

fig. 4. Left. Position of the Terrils in the Limburg mine. Credits: Dreesen. Right. A group of people collecting mining scraps from the Terril of Waterschei. Credits: Minten..

fig. 5. The Terril of Waterschei reclaimed by the forest after the ending of extraction activities. Credits: Heemkring Heidebloemke.

fig. 6. The heathlands surrounding Winterlag. Traces of recent ‘clearing’ are visible in the middle. Credits: elaborated by Jacopo Zani.

ENDNOTES

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13 AN ANTHROPOGENIC THICKNESS

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The research territory is Sardinia, particularly the palimpsest deposited during the last century with cultural, social and technical trajectories: the mining industry palimpsest, configured following purely extractive rationalities, deserves to be observed for its reaction to environmental processes.

. We should observe these territories trying to understand the new nature constructed by interacting with deposited technical stratigraphy. The mining soils generated by this interaction deserve to be reread not only as relics, discards or environmental emergencies but as elements of a new territorial structure. The socio-ecological transition requires looking at soil through its thickness, from an inert surface to a living body on which certain ecosystem services depend. It is necessary to construct a new, deeper gaze and restitution that represent its ecosystem services, the relationships built up over time and possible future trajectories. Today, urbanism must take on the need to restore plural functions to the soil, capable of responding to the new socio-environmental challenges. Our actions will contribute to the slow process of sedimentation of this depth, with the awareness that these must take place over a long time.

13·1 ECOLOGICAL TRANSITION THROUGH THE SOIL

The word transition has recently occupied much of the scientific and public debate. Its broadest definition indicates a transformation process from point A to point B, including possible inertia, stagnation and acceleration. Its recent declinations indicate the transition to more sustainable models that cope with the increasingly pressing emergencies caused by climate change. There is a predominant ecological decline that is leading to an acceleration of the modernisation processes of the development model towards the reduction of CO2 emissions. However, within the debate, it is less common to see trajectories that imagine a rethinking of development models towards a reduction in consumption and a deepening of the spatial repercussions of policies. The predominant narrative thus supports a technical approach with little reflection on socio-ecological and spatial mechanisms (Armiero 2021; Coppola et al. 2021).

Reducing and halting consumption have polarised the reflections of architects and urbanists in approaching the subject of soil, recognising urban growth as one of the main threats which need to be regulated within limits that are often disregarded. The criticism of its consumption is based on a deeper reading of planet Earth's epidermis (Pavia 2019; Pileri 2006). Its role as a regulator between the atmosphere and lithosphere and its capacity to store carbon (Lal 2004) make it relevant in ecological transition processes. In the contemporary debate, we see a greater sensitivity in observing it, recognising its three-dimensionality, fragility and very long formation times that lead it to be considered a non-renewable resource, as the increasing number of studies, reports and the series of European directives demonstrate.

Despite this, there is still a lack of perception of its fragility and role as environmental and social infrastructure, and annual reports on soil consumption denounce its continuous loss.

Growing ecological awareness of soil is building a critique of its waste and calling for community and national policies to safeguard it. However, the criticism of soil consumption cannot be the only reflection of the discipline of urbanism. The possibilities for regeneration and repair of "consumed" soils open up a renewed awareness of urban design. Transition is also necessary for gazes on anthropogenic soils, recognising heterogeneity and multiple functionalities in those "consumed" fragments (Viganò 2023; Paleman et al. 2021). This does not mean supporting a reductive approach based on a net consumption calculation that equates different soil types, nor does it mean imagining operations to restore a specific idea of nature. It is necessary to deepen our knowledge of soil, to recognise its differences and to explore those formation mechanisms that allow us to interact with it. In this sense, there are relevant studies by a branch of pedology that do not look at soil just as a material to be classified but as a subject to interact with (Levin et al. 2017).

13·2 PROJECT OF THE SOIL AS ANTHROPOPEDOGENESIS

As architects and urbanists, we should pay the same attention to the dynamics of soil consumption and reconstruction practices. In "Progetto di suolo", Bernardo Secchi (1986) observes soil through design in order to build new relationships between the materialities of the city and the territory. It is crucial to take up this concept and, through increased ecological sensitivity, imagine that design can build new living soils (Barcelloni Corte & Boivin 2021). The socio-ecological transition should bring into play specific ways of inhabiting the soil as part of rethinking our relationship with the environmental sphere, starting from our territories. Urbanisation processes are understood above all as 'consumers' of soil and opposed to free soils in a dichotomy that fails to learn the different stratigraphies of the contemporary territory.
Jenny's equation (1941) relegated human activity to the background in the pedogenesis processes. Now we know how relevant this is, not only in terms of consumption through sealing but also in terms of modification and construction.
The climate crisis makes it necessary to renew our gaze towards the soil, and the interaction with the soil science offers us various insights. In particular, it is worth considering for its understanding of the 'new' soils being denominated 'anthropogenic soils' (Soil Survey Staff 1994) and for the research related to pedotechnique (Capra, 2010; Vacca et al., 2008). The latter looks at techniques for artificially modifying soils, breaking down a static reading and inserting human activity into a dynamic and evolutionary process. The ways in which soil maps are represented render a dimension of inertia in which the geological time scale is preponderant and anthropogenic soils remain unmapped. The conceptualisation of ecosystem services (Haygarth & Ritz, 2009) opens up a complex interpretation of soils, including anthropogenic soils, explicating the plural possible function of each, including the most degraded (Viganò, 2023; Levin et al., 2017). This allows us to adopt a new interpretive lens and to attribute an essential role in the processes of ecological transition towards a renewed relationship between humankind and the environment that would produce new ways of adaptation within urban design. Thus, soil becomes an essential medium to rewrite this relationship. If we look at the territory as an enormous operation of soil movement, it is relevant to think of the extraordinary heterogeneity that derives from it. Concerning this, a new season of surveys is necessary in order to study its characteristics and conceive design as a tool capable of modifying its thickness and creating multiple ecosystem services.

13·3 A THICKNESS OF RECENT SOIL

The territory observed in the PhD research is Sardinia: in particular, this reflection is concerned with the palimpsest created over the last century as a result of cultural, social and technical trajectories, that today appears as a coexistence of remnants and new emergences of extractive development models. Identifying this deposit through exploring historical and

contemporary cartography and intense photographic fieldwork reveals complex production geographies.
Although mining activity is present in different parts of the island with different intensities, it is in the Sulcis-Iglesiente region that we find the most relevant presence of it. Here, two mining strands have developed: the metalliferous one in the Iglesiente and the carboniferous one in the Sulcis. Of all the seasons of transformation, the mining one is undoubtedly the one that has contributed most decisively to the construction of a new thickness. Technical surfaces and large amounts of waste, reciprocal to the voids of the subsoil, altered the contours of the land radically (fig. 1). The event that kicked off the great mining season can be traced back to Savoy reformism, with the law dividing ownership between soil and subsoil. The subsoil became the state's property, which could grant concessions for the extraction of minerals. This attracted a large amount of capital, mainly from outside the island. This can be regarded as a colonial action: large quantities of minerals left the island, the material processing chain remained weak, and most Sardinians were employed in jobs that did not require a high degree of qualification.
Today, this mining history is definitively over. We can read about various moments of transition and crisis, but at the beginning of the 1990s, even the last mining sites were closed, and a slow progressive decline began (except the Nuraxi Figus coal mine, which closed in 2018). Currently, the region has to deal with the environmental and social legacy of this affair. It is a remarkably complex problem in which several factors are intertwined: the presence of an enormous heritage of empty spaces that are often isolated and not easily reconverted, the scarce availability of economic resources, the environmentally severe criticalities, the inertia of imaginaries built over time precisely on an ambiguous relationship of dependence and exploitation, identification and conflict.
The materials extracted from the subsoil follow a process of mineral separation that configures the territory as a productive machine, redesigning a new complex orography. Extraction, Washing, Storage, Maintenance, Disposal, Residence, Management and Services have an architectural correspondence on a ground articulated on a network of mining railways, roads and paths. We can identify a new technical thickness, based on the mining rationality, made up of slopes, terraces of inert material on which the same artefacts of the production cycle often rest, water tanks and canals, infrastructural tracks and extensive ponds of residual material.
The void, articulated in a dense network of subsoil tunnels, corresponds to a new reciprocal mass on the topsoil. The first distinction is between mineral-free material, quarried to reach the metal-bearing strands, and residual material, wasted from the mineral washing process.
In the former case, the material was deposited and stabilised near the settlement, forming its base or pouring at the tunnel entrance. For this reason, it is easy to identify accumulations that interrupt the dense scrubland and, on the surface, appear to have no direct connection. According to the granulometry and stabilisation degree, these surfaces accommodate different pioneer plant species that form scattered meadows characterising these landscapes (fig. 2). Shape and granulometry affect runoff and water settling, accommodating different plant species and generating different

substrates. Process residue landfills are often ponds in which containment work accommodates processing sludge. The result of mechanical, chemical, gravitational or magnetic separation processes, depending on the technologies employed, represent the most problematic legacy because they contain large quantities of heavy metals. These masses' fine granulometry and the high compaction make pioneering operations more difficult. The shape of the basins and low permeability allow the formation of wet environments, resulting in a specific vegetative series.
A distinction must also be made between the remains of metalliferous and carboniferous workings: just as geological substrata generate different soils and vegetative series, different waste generates dumps with different criticalities and possibilities for plant colonisation.
While a red background characterises the metalliferous mining waste landscapes due to processing, the natural presence of metals and more sparse vegetation, the carboniferous ones present a grey background and richer vegetation due to organic material (fig. 3).
Landform meadows represent an important field of observation and study because they provide helpful information for understanding pedogenesis processes in extreme locations. The interaction with the biosphere has initiated a process of metamorphosis of this technical thickness (fig. 2).
Various observations and experiments on mining soils are currently underway. In fact, a decade-long line of research has observed the interaction of plant species with mining soils (Bacchetta et al., 2007; Sprocati et al., 2014), whereas a more recent one deals with the creation of technosols through pedotechnics. The superficial movement of waste, including organic material (compost) and a mixture of seeds (mostly leguminous), provides for the rapid colonisation by pioneer species. Observing these territories highlights how human action leads to a stratification process in time as a predominant pedogenic factor compared to others.
From this point of view, the Nuraxi Figus coal mine (in a period of transition towards total closure) is the object of important experiments thanks to a series of funded and ongoing projects. In particular, coal processing residues are proving to be excellent soil conditioners that, according to underway studies, could draw on the deposits present. The need for environmental restoration of the sites has stimulated these experiments. However, one of the paradoxes of restoring the original landscapes is dismantling some infrastructures such as still-empty tailings ponds, flotation dams, and terracing for depositing material (fig. 4). While there has been a recognition of the cultural value of buildings, the same cannot be said about the ground on which they often stand, with the exception of the emblematic case of the red muds of Monteponi mine, that are protected within the Regional Landscape Plan for their shape and colouring. This short-sighted approach does not consider the energy accumulated in these operations and that one needed for demolition neither, does not see these landforms as elements of a new landscape and does not recognise the value of the new growing nature. The orography of this new thickness affects water flows, allowing stagnation, accumulation and the formation of new biotopes and new soil thicknesses and types. In addition to being a problem to be sealed, these deposits can be significant fields of experimentation and research.

13·4 MINING SOIL AS A LABORATORY FOR TRANSITION

If we intend transition as a complex social metamorphosis, then post-mining territories can be an important laboratory for experimentation. How can we transform the extractive thickness built up over time, which constitutes a true spatial capital today, into a socio-ecological infrastructure? Mining territories represent an extreme example of alteration of the earth's crust with excavations, dams, terracing, deposits, and waste that interact with environmental dynamics, generating new soils. We can add value to this new thickness just if we step outside the dominant categories of heritage and nature by recognising the work of natural agents as spatial capital (Bevilacqua, 1996). This means investigating our relationship with technonatures (Escobar, 1999). Mining soils result from anthropopedogenesis processes (spontaneous and induced) through interaction with different technical stratifications. Observing these soils, deconstructing their predominant narratives of nonrenewability, and recognising their potential ecological value permit exploring a potential design (Viganò, 2023). The ecological transition will necessarily go through a reflection on our relationship with the different types of nature that anthropogenic disturbances inevitably generate (Tsing, 2021).

It is essential to deepen studies of these natures by designing new spaces because we cannot expect to restore landscapes according to an organic, primal idea of nature. Besides, energetically unsustainable, environmental restorations represent a retreat from the design of possible futures. The securing operations described in the previous chapter are not an alternative to land reclamation. However, they can help in limiting runoff, improving CO2 storage capacities and creating the preconditions for future socio-ecological infrastructure, whether reclamation, reuse, fallow or abandonment. Besides being a problem to be solved, they could be a resource. We should consider stimulating specific soil mechanisms and, in some cases, accept that they will be inaccessible for a long time. The closure of mining sites has led to the self-regulation of some natural cycles; observing the outcomes and ongoing processes today suggests that we should be positioning ourselves cooperatively with them to build new spaces of coexistence. An intensive campaign of sampling and monitoring anthropogenic soils could help to understand their functioning and to shape new descriptions.

A consistent part of research in urbanism today involves a collective study phase of renaming and reinterpreting the territory. The effort to represent soils beyond fertility categorisations manifests this current. Reflections on soils deepen their semantic thickness through different gazes: pedological, geological, botanical, economic, landscape, agronomic, etc. As architects and urbanists, we aim to multiply this thickness by holding different gazes together through descriptive and design efforts. The design can be used to interpret soils as a product of anthropopedogenesis (Meulemans, 2020). In this perspective, the anthropogenic thickness of mining territories constitutes a design material from which to learn and experiment by constructing spatial prototypes capable of generating a renewed relationship between territory and soil.

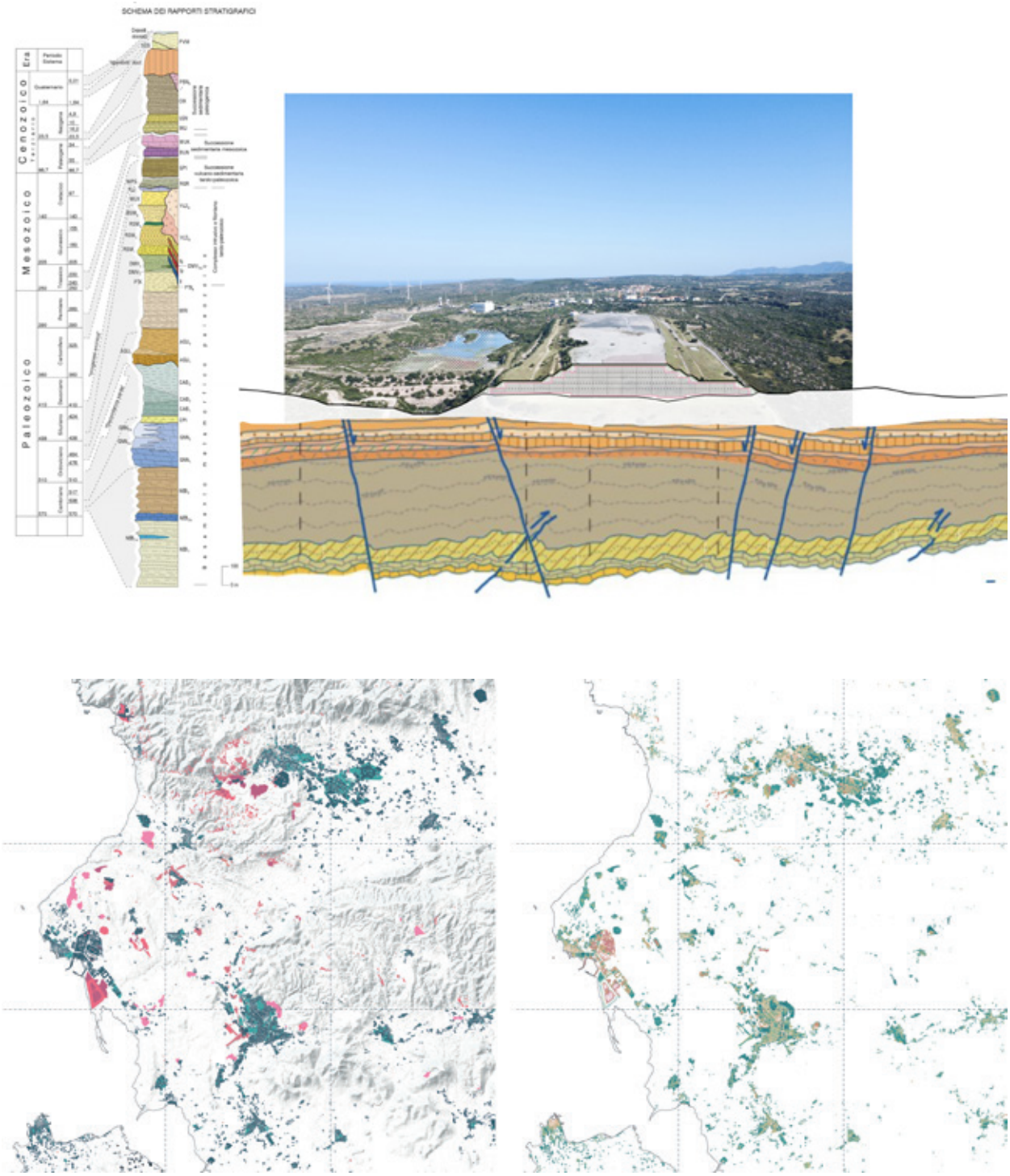

fig. 1. Section on Nuraxi Figus coal mine in Sulcis-Iglesiente. Storage operations for processing waste and ashes from the nearby coal-fired power plant are currently building a new orography and young soils that are being added to geological strata. Credits: elaborated by Davide Simoni.

fig. 2. Map of anthropogenic soils and their SAVI index. On the left: In pink mining soils, in blue urban soils. On the right: In green are the major vegetative indices. A comparison of the two maps shows how much of the mining soil has achieved a relevant vegetative index. Credits: elaborated by Davide Simoni.

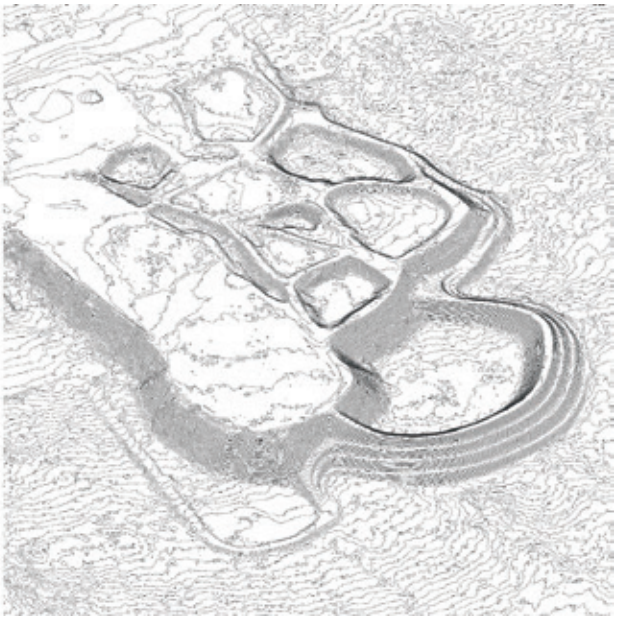

fig. 3. Top view of two mining soils: On the left: Metalliferous processing residues (Monteponi Mine). On the right: Carboniferous processing residues (Serucci Mine). Credits: elaborated by Davide Simoni.

fig. 2. One of the demolished dumps. Residue storage systems are organised in basins. The dam, made of ore-free materials, contains the processing residues. Once the maximum capacity is reached, it is capped with one layer of clay material and another of inert material. Credits: elaborated by Davide Simoni.

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14 THE BUKAVU URBAN REFERENCE PLAN: AN INSTRUMENT FOR TERRITORIAL TRANSITION?

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Since Rio in 1992, the local Agenda 21 has been a sustainable development tool for the implementation of urban policies that promote the concepts of green, resilient, circular, inclusive, participatory and decentralized cities.

The territory in transition approach, initiated in Great Britain in 2006, raises citizens' awareness of the challenges of ecological and social transition, mobilizing them to act locally for a more resilient and sustainable society. In DR Congo, bilateral and multilateral organizations such as the French Development Agency (AFD), the Japanese International Cooperation Agency (JICA), UN-Habitat and the World Bank (WB) disseminate these concepts and finance urban planning studies without necessarily taking account of the legal context and the practices of local players. Bukavu, a medium-sized border town located next to the mining area in the Great Lakes region, is currently undergoing a marked transformation of its urban landscape. While the above-mentioned values advocate for the protection of the environment and the promotion of green spaces, the priority needs of the majority of the population are expressed in terms of availability of land for housing. In the context of accelerated urbanization and the economic dynamics linked to mining and the "informal sector" that accompany it, the WB has just financed the development of an Urban Reference Plan (URP) in order to provide an answer to the complexity of this urbanization and guide the city's development towards a sustainable local development. Placed in the field of planning theory (James et al., 2013; Wheeler, 1998), this article questions the relationship between the objectives pursued by the local Agenda 21 and the urban planning practices of the actors during the process of elaborating the Bukavu URP. On the basis of an analysis of the various reports produced and the activities organized during the process of drawing up the Bukavu URP, this study examines whether the options selected make it an effective instrument of territorial transition for responding to the challenges facing the city. In addition, the paper analyses the positioning of the Bukavu URP with regard to the values of territorial transition.

14·1 TOWARDS THE GLOBALIZATION OF SUSTAINABLE DEVELOPMENT IN URBAN PLANNING

At the global level, urban planning documents are now designed through a sustainable development vision, and they seek to integrate the various sectoral plans (housing, transport, environment, land, etc.) in order to reconcile the target of sustainable development and make them consistent (Lerousseau, 2017). Their elaboration process and content give rise to numerous debates and theories (Douay, 2013; Bognon et al., 2020). For example, in terms of sustainability, Filion and Hramer (2011) analyzed the content of the plans of six of the largest Canadian urban regions, and highlighted the predominance of the nodal model as a strategy for reducing automobile use. Camille Girault (Girault, 2016), for her part, examines the sustainable city model through the example of Northern European cities, and shows the ambitions and performances that have fueled the construction of an environmentally-centered Nordic model that these cities are now using to assert themselves on the European and global scales in a context of "coopetition" between metropolises. Her analysis also emphasizes that the Nordic sustainable city model does not exist in itself, and that it must be validated by its construction and dissemination. With regard to Congolese cities, research has mainly focused on Kinshasa because of the numerous urban plans developed in this city (De Maximy, 1984; Pain, 1984, 1985; Mpuru & Mbukulu, 2008; Lelo Nzuzi, 2011; Amani Muhizi, 2022). These works analyzed the content of the plans developed with a particular focus on their weak implementation, with no much focus on the process of their development. Given the Western-centric imagination, the goals of sustainable development are incorporated into the various urban plans, but to date, no plan has been confronted with the objectives of sustainable development. In a context where the practical usefulness of the urban plan is being questioned by many players and its social legitimacy is being debated, this article analyses how the URP addresses the tension between the vulnerabilities of the urban fabric and the needs of the population, how the plan reconciles the productive economy and the informal economy, and the practices of residents for a social transition and ecological preservation in the face of the challenges of climate change and demographic pressure.

14·2 AN URBANIZATION MARKED BY DEMOGRAPHIC PRESSURE, OROHYDROGRAPHIC CONSTRAINTS AND AN INFORMAL ECONOMY

banization due to insufficient resources and little political interest. For more than two decades, the city has been experiencing an explosion in population and it has experienced a demographic explosion that has resulted in a growing demand for building space, housing, community facilities, transportation infrastructure and basic social services. The population has grown from 75,000 in 1960 to over 1,500,000 today, a 20-fold increase. However, spatial growth has only increased threefold. According to data from the "Institut National des Statistiques" (INS), the average annual growth rate of Bukavu's population over the past five years

is approximately 23%. This rapid increase in population is explained in particular by the accelerated rural exodus, which has been accentuated by insecurity in the regions surrounding Bukavu. This insecurity is linked to armed conflict and the exploitation of minerals in the region, a topic that has been extensively documented in research works such as Garret (2016), de Failly (2000) and Geenen (2014)

The city also faces recurrent natural and man-made disasters (Butara et al., 2015; Mugaruka et al., 2017; Buhendwa, 2019). Meanwhile, residents develop coping strategies to overcome these challenges (E. M. Mudinga & Wakenge, 2021). However, these events have consequences on the urban fabric, which undergoes horizontal intramural overdensification, characterized by plot fragmentation and occupation of vegetation cover, which alters its landscape and extra muros urban sprawl that leads to the consumption of agricultural space.

Urban development is mainly supported by the initiatives of the inhabitants, due to the lack of public investment in the urban fabric. This "endogenous urbanization" has attracted the interest of several studies on the process of urban sprawl (Ndyanabo et al., 2010; Mugisho, 2019), which have revealed strong land speculation due to the increasing demand for buildable land (Akilimali et al., 2021; Bruneau, 2012; Nyenyezi Bisoka & Ansoms, 2016). Other studies have focused on the effects of urban growth on the urban fabric, particularly highlighting the gradual loss of vegetation cover and the resulting vulnerabilities (Bayumbasire et al., 2021). In addition, endogenous urbanization exacerbates problems of access and management of land ownership (Nyenyezi & Ansoms, 2014; Kibul, 2019; Baraka Akilimali, 2019). Rural exodus is the main cause of Bukavu's rapid urbanization (Nyenyezi Bisoka et al., 2021). However, city managers face governance issues and challenges inherent to the demographic pressure and site geomorphology, whose constraining features are rarely taken into account during urban development operations. The urban topography, with its steep slopes, makes construction and accessibility difficult, while reducing the site's carrying capacity.

In addition, the city is located on the watersheds of six major rivers (Ruzizi, Kahwa, Wesha, Tshula, Bwindi, and Nyamuhinga) that flow through it, posing problems for their development. The region also has one of the highest rainfall rates in the country, with rainfall levels that make sanitation a major concern and require intelligent drainage and management.

We should also note that the city of Bukavu faces a situation where the state has a partial hold and the urban economy remains largely "informal" (Baissac et al., 2012). The urban audit, although incomplete, revealed that the city lacked sufficient financial resources to implement its policy. Indeed, the main sources of funding for local development are taxes collected on municipal markets, as well as fees associated with civil registry services. Because of the partial control of the state over the city and the poor economy, local government in Bukavu does not have sufficient authority to manage the city effectively. Urban management is the responsibility of central government structures, such as the provincial divisions of urban planning, land affairs and cadastre. However, the province is responsible for administrative supervision only. This situation leads to uncontrolled dynamics in land use, which is a common problem observed in

most African cities due to the lack of urban planning according to several authors (Vermeiren et al., 2012).

14·3 DECENTRALIZATION, PARTICIPATION AND INCLUSION: A MAJOR CHALLENGE FOR INTEGRATED PLANNING

Today, urban planning is an important lever to help cities adapt to climate and ecological challenges while promoting harmonious local development. However, some actors criticize the fact that the elaboration of urban plans often remains the domain of agencies from the North, leaving local technicians in the shade or limiting their role to that of "faire-valoir". Moreover, these foreign agencies often export their own models under the label of "good practices" or "benchmarking"(Bourdin & Joël, 2016) via international organizations. This trend then inhibits any autonomy of African cities and prevents the emergence of new urban models (Chenal, 2009). For the URP, in an effort to build capacity, the WB relied on local expertise by entrusting the Spatial Planning Unit (UPS), a laboratory of the "Institut Supérieur d'Architecture et d'Urbanisme" (ISAU), with the task of drawing up the plan. The implementation of the project highlighted a latent problem in Congolese urban governance: that of decentralization, established since 2006 by the Constitution and supported by the laws on the free administration of provinces and on decentralized territorial entities. Although decentralization is supposed to affect all dimensions of urban management, urban institutional actors often remain modeled on the centralized model that prevailed in post-independence political regimes, despite some initiatives to promote a "local development culture. In this sense, the URP was under the supervision of the Ministry of Urban Planning (central level) and involved the provincial governor (provincial level) as an intermediary for the implementation of the project in his territory, while the mayor of the city (local level) was the beneficiary. And yet, the responsibility for local urban management lies with the mayor, who should have been in a position to take charge of the project. This situation highlights the formal nature of decentralization, which has not yet led to a real constitution of local powers (Mashini, 2014). Other values of Local Agenda 21 concern participation and inclusion. UPS did not deviate from this by involving local experts in the design of the RUP. The restitution and validation workshops included a diverse representation of different social and professional strata, including focus group work for certain phases of the project. Although the mechanism can be criticized for its elitist representation, it nonetheless allowed the empowerment of "weak" categories (Genard, 2013; Bacqué & Biewener, 2015) to be mobilized in the PUR development process. However, we will agree with Felli (2005) that workshops often serve to legitimize the processes rather than to integrate the citizen into the public decision. Moreover, this participatory form can limit the debate to questions determined by the experts, going against the indeterminate character of the debate in a democracy. Also, power is not always distributed according to the institutional and legal framework, and other poles of power may be involved in making the state (Bierschenk & De Sardan, 1997) in a process of negotiation and competition (Migdal & Schlichte, 2005) with the structures

clothed with official power (E. Mudinga & Bisoka, 2014). The "all-powerful" land and real estate commissioners have remained on the bangs of the URP study, even though they are the primary actors and depositories of the urban fabric. The subdivisions and parcelling out of land are played out at their level and go as far as to dictate other norms such as the minimum limits of a plot.

14·4 THE URP IN THE FACE OF URBAN ISSUES AND THE GOALS OF TERRITORIAL TRANSITION

The review of the URP does not reveal the integration of the criticisms expressed in the evolutions of urban planning models (Bognon et al., 2020). Although there are some clearly defined orientations such as the establishment of a primary and lacustrine road network, as well as non aedificandi and extension zones, there are no other concrete projects identified that could produce results, but rather several projects that cannot be accommodated by the local development context.
Bukavu, being a city that is welcoming to people without shelter or employment, sees thousands of people arrive each year in search of a "safe haven. However, the URP's orientations are focused on rationalizing the use of space at the regional level, while decongesting the main city. If the analyses in the URP had taken into account the demographic dynamics at the regional level and the link between mining, insecurity and the urban fabric of Bukavu, the development of the urban region between Bukavu and Goma could have been envisaged. This development could contribute to the territorial and geostrategic balance of Kivu [fig. 6.].
The URP envisages the promotion of highways to contain traffic and a cable car to improve accessibility to high altitude sites, as well as the development of urban lake transport. However, the second option is not adapted to the city's current situation and the third requires a socio-environmental impact study to quantify the risk of lake pollution and methane gas exposure. The strengthening of nodal polarities; the development of sidewalks and pathways created by use to promote walking should be prioritized, as well as the organization of public transportation to reduce travel needs and promote the spatial balance of the city. As Bukavu's geomorphological setting is very constraining, the URP provides for nature reserves and parks to preserve the natural landscape for all areas with slopes greater than 18%. While laudable, this measure could lead to social tensions if relocation mechanisms are not provided. In addition, limited resources make its feasibility uncertain. In order to reconcile the needs of residents with the preservation of natural areas, it would be preferable to establish fiscal incentive mechanisms to encourage the preservation of natural areas on urban properties rather than fragmentation, such as reducing property taxes for those who preserve these areas and increasing them for those who encumber their plots. In addition, an incentive to develop a public space with green spaces, pedestrian paths and children's play areas would have been achieved in the form of a specific development plan. (PPA) instead of PPAs realized in a self-sufficient approach. However, the RUP also provides for the construction of water retention basins, drainage channels

and rainwater collectors to prevent flooding and protect the urbanized areas. Although the URP takes into account the promotion of productive economic sectors, such as agriculture, industry and services, in the creation of innovation platforms, which are poorly adapted to the context, the plan does not create synergies between the informal and formal economic sectors, nor does it create opportunities for economic development by encouraging collaboration between the two sectors. From a spatial point of view, the plan makes no provision for workspaces adapted to the needs of the many "informal" jobs or for the appropriate layout of market spaces for small traders, for whom the pavement acts as a shop window. What's more, the document does not give pride of place to microfinance structures, such as cooperatives, which support and manage the resource-rich informal sectors.

14·5 CONCLUSIONS

From the above description, it is clear that the sustainable and resilient city is a concept that must take account of each context. The city will only be sustainable and resilient if it meets the real needs of its inhabitants in terms of the provision of decent housing, activities and basic social services. The prioritisation and objectives of the plan should be derived from the problems experienced and from an analysis of the local situation, particularly in the case of Bukavu, where the most important thing is to find a plot of land on which to build a house, or a space in which to develop an income-generating activity in a context of insufficient land for building and formal employment. In this case, planning must be based on a genuine urban diagnosis (reading, interpreting and re-conceptualising the practices of those involved in the urban fabric), which will enable us to understand the area with all its subtleties and then propose appropriate solutions tailored to each case. This is the only way to reconcile the universal values of sustainable development with the expectations of local residents. To achieve this, we need to be able to identify and take account of the players already involved in the urban fabric. We must no longer regard them as mere beneficiaries or ignore them, as was the case with the "commissioners". However, we must seek to encourage their commitment and empowerment through contracts defining the role of each stakeholder within each urban project. This would lead to a social transition tending to decolonise and codify user practices in terms of modes of transport, waste management and types of construction adapted to the geomorphological context. This ecological transition is essential if the city is to undergo a territorial transition. Lastly, for designers, a holistic approach that takes account of all the issues and opportunities in the area is essential if this transition is to be successful. In this context, where the city is built by the residents themselves, with some occasional investment from donors, and where the public authorities focus mainly on the rehabilitation and maintenance of roads, as well as water and electricity supplies, one of the main challenges for planners is the inclusion of vulnerable populations. Given the limited resources available to public authorities, how can their needs in terms of housing, infrastructure and basic social services be met?

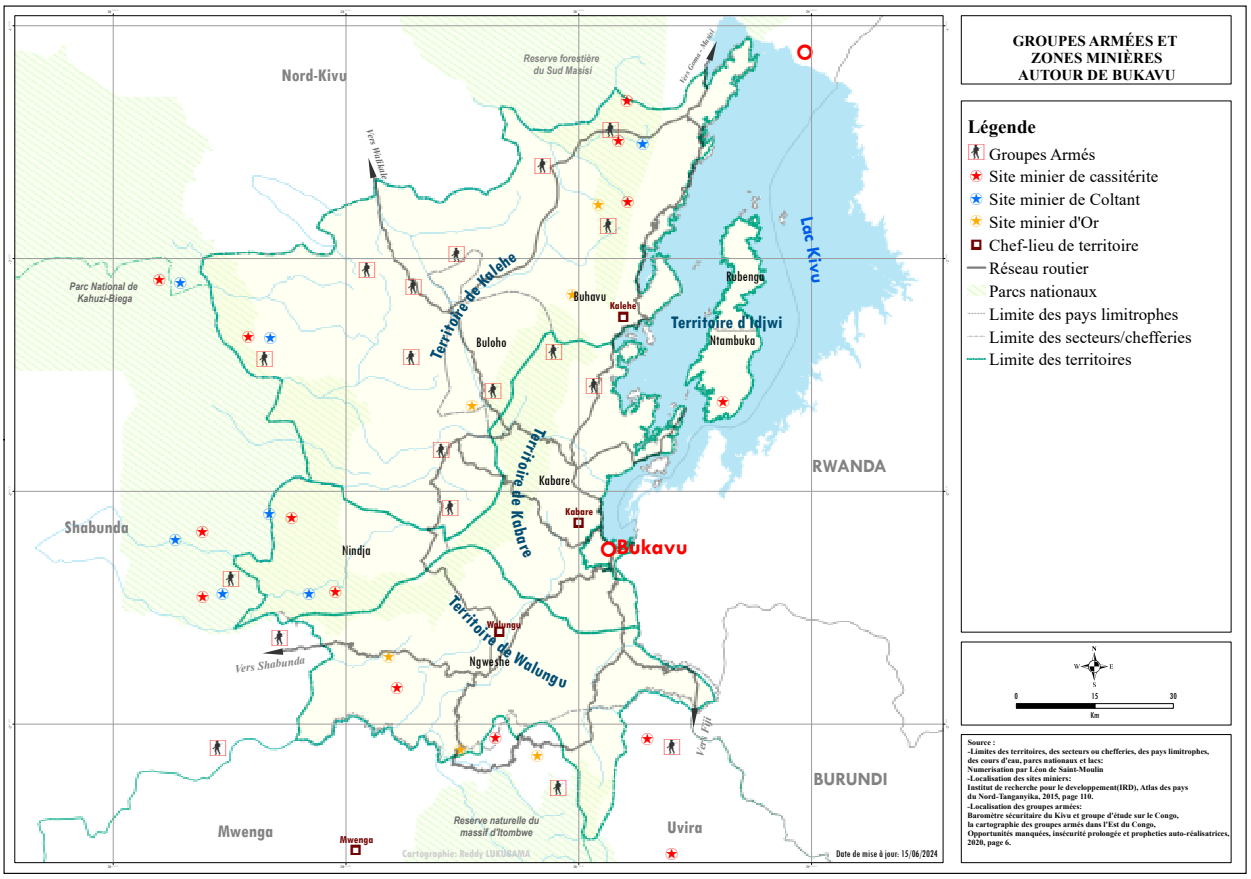
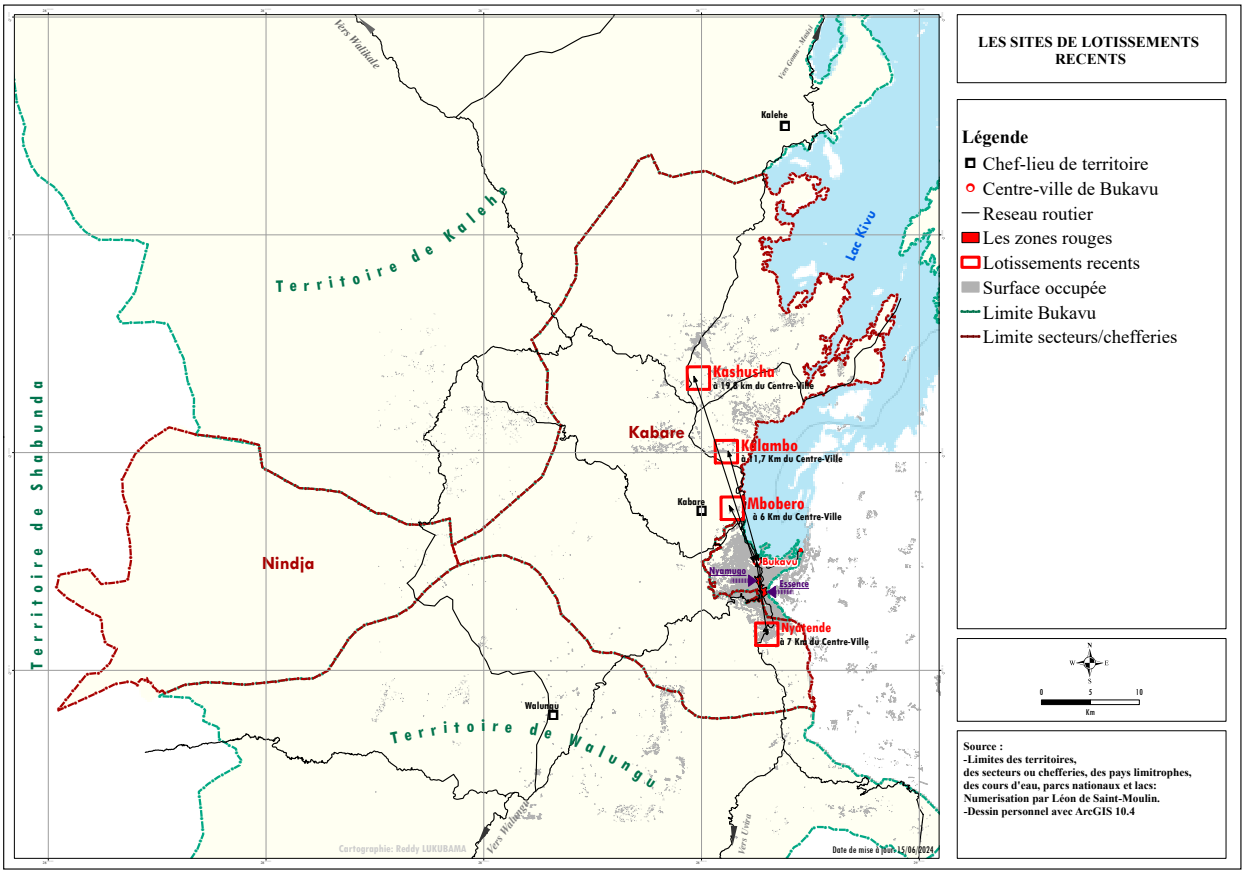


fig. 1. Location of armed groups and mining sites around Bukavu. Credits: elaborated by Gulain Amani Mushizi.

fig. 2. Progressive loss of vegetation cover by the city. Credits: From Bayumbasire et al., 2021



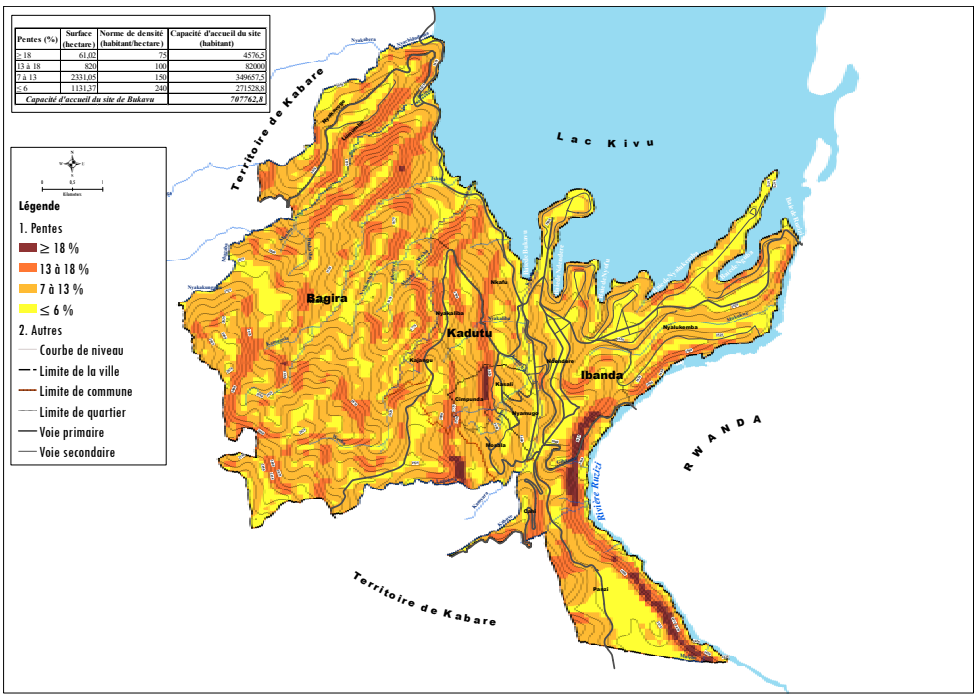
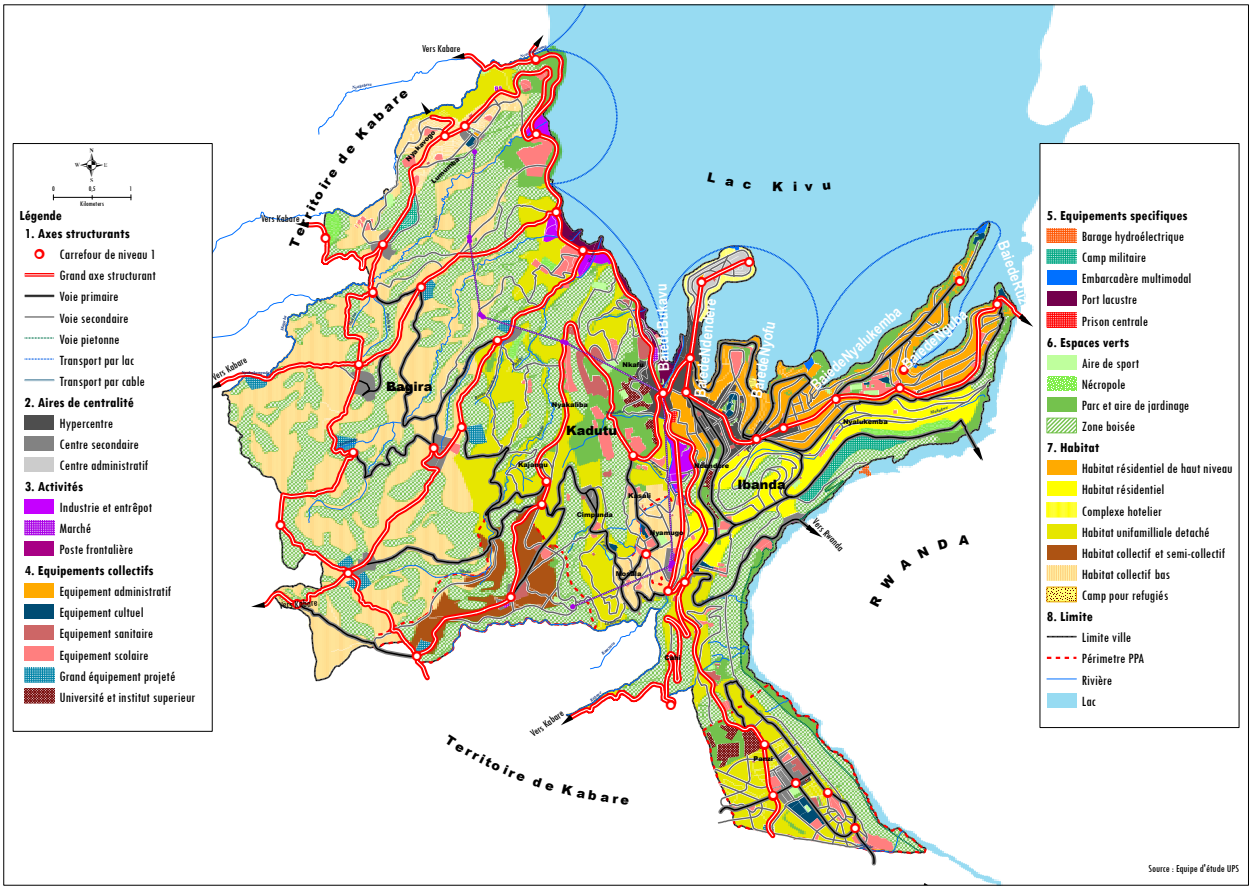


fig. 3. Location of housing estates in the Kabare agricultural territory. Credits: elaborated by Gulain Amani Mushizi.

fig. 4. Topographical map of Bukavu and carrying capacity. Credits: elaborated by Gulain Amani Mushizi.



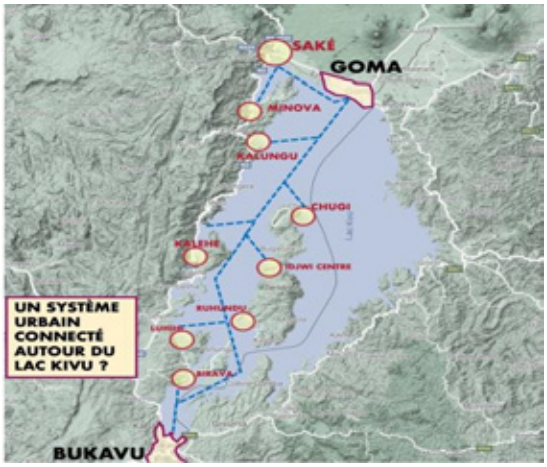


fig. 5. URP Bukavu. Credits: UPS-ISAU, 2021.

fig. 6. Bukavu-Goma urban lake region. Credits: Goethals, 2021. .

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15 TOWARDS A CULTURE OF SOIL RELATIONS

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This contribution aims to reveal and overturn the paradoxes and contradictions underlying some European soil strategies and programmes promoted in the context of the ecological transition.

The priority is to protect natural soils from urbanisation, which, according to these strategies, tends to degrade the soil. The imperative of protection implies a contrast between supposedly healthy soil, generally linked to the agricultural and natural environment according to the programmes referred to, while stigmatising and neglecting urban soil as degraded and infertile. The analysis of asphalt soils can help reverse this perspective: it will be argued that a true sustainable transition should be based on the principles of relationality, inclusiveness and fertility of soils in their entirety, including asphalt soils..

15·1 YEARNING FOR PROTECTION! A LOOK AT EUROPEAN SOIL STRATEGIES FOR TRANSITION

The word transition refers to the concept of passage, crossing and it deeply implies the notion of time required to pass from a condition to a different one. The term has evolved through multiple semantic fields over time, according to the cultural contexts that made use of it. In the framework of climate change, human beings are striving to carry out a systemic transition with the main goal of reducing carbon emissions, thereby containing the global temperature rise whose impacts are well-known (Bonneuil & Fressoz, 2013; Fressoz & Locher, 2020), while limiting and curtail social inequalities produced by the actual productive system of limitless growth (Krähmer & Cristiano, 2022). These efforts interest every aspect of our everyday life: mobility, manufactory, technology, energy production, food system, waste management and others, all entangled and inseparable. As well as affecting the more material aspect of life, transition demands an epistemological and ontological shift that makes human aware of being immersed in the world, part of an evolving system, interweaved with other living and non-living beings (Coccia & Mambrini, 2022; Descola et al., 2013). From this perspective, the ecological transition is a matter of bio-politic, in the sense that it is substantially inherent to lives and bodies, both in a collective and individual dimension. Consequentially it has an extensive impact in terms of spatial configurations (Viganò, 2024).
Along this trajectory, politic unions, states and metropolises have elaborated visions and strategies to foster the ecological transition and imagine new futures. The results are tangible in the numerous strategies, policies and programmes implemented in recent years ①. These operations make clear the relevance, and at the same time the necessity to rethink the urban and territorial project (Barcelloni Corte & Boivin, 2021). Dealing crosswise with several disciplines and themes, most of these initiatives have in common a particular focus on soil management. The aim of this paper is to investigate the main conceptions that boost some of the major strategies about soils management promoted in the European context: are there paradoxes and contradictions that lie behind? What are the spatial consequences? Finally, how do soils behave in times of ecological transition?
There are several reasons behind the increasing importance of soil in recent climate change mitigation and adaptation strategies. As the European Commission states "soil hosts more than 25% of all biodiversity on the planet and is the foundation of the food chains nourishing humanity and above ground biodiversity. Healthy soils are also the largest terrestrial carbon pool on the planet and play a fundamental role in water cycles thanks to their sponge-like function that absorb water and reduce the risk of flooding and drought" (European Commission's Directorate-General for Environnement, 2021). For these reasons European Commission underlines the importance to protect the so-called healthy soils, which consist in soils that "are in good chemical, biological and physical condition, and thus able to continuously provide as many of the requested ecosystem services as possible" (ibid. 2021) ●. Among the different objectives foreseen by Eu Soil Strategy for 2030, the "No Net Land Take by 2050" (Science for Environment Policy, 2016) occupy a relevant position. The program

sets the basis to limit soil consumption defined as "the loss of agricultural, forest and other semi-natural and natural land to urban and other artificial land development. This includes areas sealed by construction and urban infrastructure as well as urban green areas and sport and leisure facilities" (EEA, 2006). In order to obtain the "no net land take" objective three main actions are recommended: limiting, recycling and compensating. Limit soil consumption consists in avoiding urban development. Recycling actions encourage re-use of brownfields and it recommends the use of non-impervious materials when soil sealing happens in order to mitigate its effects with. Lastly compensation should be required when construction must take place on previously un-built land: "this can take the form of renaturation projects or de-sealing measures in built areas, where soil sealing is no longer necessary" (EEA, 2006). This action presumes the possibility to restore the amount of eco-system functions lost due to sealing in a given area (European Commission, 2012). The "No Net Land Take by 2050" strategy was preceded by long-lasting monitoring programs and reports about soil sealing ● and its principles are adopted by some countries, as France, Belgium, Switzerland (although outside the European Union) among others ④. In Italy, besides the fact that a national law is still missing, Ispra (Istituto Superiore per la Ricerca e Protezione Ambientale) publishes a yearly report that monitors soil consumption at national level since 2003. Following the European Commission guidelines, it states the importance to protect natural soils from urban developments which means artificialisation, sealing and impermeabilization, all expressions of soil degradation. Ispra activity reaches also the local scale of analysis : in 2019 it published Il consumo di suolo di Roma Capitale (Cavalli et al., 2019) in the context of the LIFE European program Soil4Life ●. The report restates the necessity to act against soil consumption that is tackling the territory of Roma Capitale municipality and to protect natural soils: 21,9% of the entire territory is irreversibly consumed, where 14,4% consists in streets, roundabouts, parking spaces, service areas, squares and courtyards (ibid. 2019).
This brief overview outlines the protective outlook behind some of the most important strategies implemented in the European transition context, that is based on three main assumptions: urban development deteriorates natural soil thus it needs to be limited; contraposition between natural healthy soil and artificial-urban degraded soil; soil degradation processes are reversible, in particularly sealing actions.

15·2 PARADOXES AND CONTRADICTIONS IN THE PARADIGM OF PROTECTION

The mentioned programs and strategies have the merit of looking at soil as a fragile resource that needs care and a key player in the health of ecosystems: there will be no transition without including soil in any future planification. At the same time, some paradoxes and contradictions emerge according to the assumptions at the basis of protection attitude.
The first paradox concerns urbanisation developments: the current trend conceives them as a major threat to productive soils, thus it implicitly encourages the so-called "inward urbanisation" of already dense and

congested environment, at the expenses of vacant urban soils regarded merely in terms of estate economic value (Viganò et al., 2020). This conception is based on the juxtaposition of rural and urban realms and the related assumption that considers agricultural soils valuable and healthy at the expense of urban soils deemed as degraded. Conversely contemporary territories reveal a constant complex hybrid condition, where it is increasingly difficult to discern between built fabric, agricultural land, infrastructure, natural environment as forest, woods, rivers and lakes, which superimpose, intersect and mix together. According to urbanists and geographers Neil Brenner and Christian Schmid, humankind lives in a constant urbanised condition, materialized in what is called "planetary urbanisation" (Brenner, 2014) ●. In this conception, urbanisation is intended as field of relations of different types and intensities that weave together the various conditions that compose the territory in which we live. The urban realm encompasses agricultural fields, forests, woods, as well as the more densely built-up area generally understood as the city, interweaved and mutually dependent.
The second paradox of protection is closely related to the previous one: once vanished the juxtaposition between urban, rural and natural also the demarcation between urban degraded soils and natural healthy soils dissolves. Most of contemporary representations in the context of planning, policy and programmes, neglect urban soils depicted as mono-colour spots on map, resulting in a strong homologation ●. On the other hand recent studies, that go under the name of Urban Soil Sciences, show instead the extraordinary richness of urban soils which varies in composition of materials, fertility, biodiversity, behaviours, multiplicity of practices aroused (Meulemans, 2020). These investigations recognize the capacity of humans to create soils, the so-called anthropo-pedogenesis (Vialle, 2022): technosols, anthrosols, SUITMAs are some of the categories and nomenclatures used to study and comprehend urban soils (Howard, 2017; Morel et al., 2015; Richter, 2020). In this way this particular branch of knowledge aims to introduce urban soils under the lens of observation, entrusting them with an important and consistent role in the ecology of our everyday environment.
The third paradox involves the transformative and processual properties of soils. The protection paradigm admits the possibility of restoring soil conditions prior to degradation, especially soil sealing, which is considered the most dramatic stage of soil deterioration. In particular, the Guidelines on best practice to limit, mitigate and compensate soil sealing (European Commission, 2012) indicates compensation actions as the last resort of soil protection against sealing. It means that "each sealed area corresponds to a de-sealing action, but one that is capable of restoring the amount of eco-system functions lost due to sealing in a given area" (ibid. 2012). This concept, besides the stigmatization of sealed soil as something degraded to be healed, clashes with the oft-stated impossibility of re-establishing previous soil conditions (Siebielec et al., 2010). How claim that a de-sealed soil will provide the same functions as a given previous condition? How to measure the performance of past and future functions? Moreover, what time horizon is referred to as the previous condition?
A critical overview of these three paradoxes set the basis to take a position that aspires to step aside from the paradigm of protection, which

tends to produce still images of crystallised soils suitable to humans will to pull out the needed products, values and ecosystem services. In order to promote a substantial concern for soils that overpass the extractive attitude lying behind the desire for protection, it is necessary to drop any moral or preconceived judgement that oppose natural to artificial, healthy to degraded, productive to fruitless: let's look all the soils as complex fields of relations between a multitude of actors in continuous evolution and generation. Such a culture of soils is capable of include other subjectivities, thus questioning the idea of subjectivity solely linked to the concept of the human person (Luisetti, 2023). This is the first move to shift from design over soils to design with soils (fig. 1) and all the non-human bodies that participate to their process of making. But, how to take apart the paradoxes and contradictions of protection? How to boost a culture of soil relations? What posture to hold?

15·3 PARADOXES AND CONTRADICTIONS IN THE PARADIGM OF PROTECTION

Let's start from very essential operations: looking down, close up the gaze, touch the soil, dig into it (Meulemans, 2020). Downscaling the gaze and feel the fine grain of urban soils are the most spontaneous and genuine practice to acknowledge to every coring sample of soil different qualities, properties and behaviours (Vialle, 2022). The case study of asphalt can be revealing in the aim of dissipate the aforementioned paradoxes and conceiving soils as fields of relations in continuous construction: even one of the most -supposed- artificial and inert material of urbanity (Zardini et al., 2003) reveals itself as fields of relations, a lively and ultimately fertile matter. First, a brief overview of the nomenclature of asphalt is necessary, which is ambiguous, complex and differently rooted in epochs and cultures (Speight, 2016; Zardini et al., 2003). Since its most ancient uses the word asphalt signified either a rock - generally limestone or sandstone - impregnated with bitumen, the so-called asphaltic rock, or a composition with a greater presence of bitumen, black and very viscous in appearance, with minerals residual characterizing the purity of the bitumen composition. It has also been used to refer to tar and pitch, materials of completely different origin, as they are obtained from the distillation of coal residue, but with similar aspect and behaviour of bitumen. In any case, it is appropriate to say that the world asphalt has been always connected to the presence of bitumen and it occurs widely in environment. As limestone and sandstone, even bitumen is the result of complex and long geological processes: bitumen is the heavy fraction of petroleum formed from sedimentation of organic matter after a great mass extinction during the Palaeozoic between 500 and 250 million years ago. Bitumen exists on earth impregnated between layers of rocks and it emerges in springs, puddles, lakes or even through submerged volcanoes (Abraham, 1920). Nowadays the same geological processes are condensed inside petrochemical plants through different distillation steps of crude oil. Asphalt is commonly understood as the man-made material –more properly the bituminous conglomerate– that covers roads, car parks and many other open spaces throughout our cities

landscape? Are we facing a healthy or degraded soil? Similar questions raise in Bonames Airport Conversion designed by GTL in 2004 where a very similar concept of "creative destruction" has been implemented (Broggini & Metta, 2023). However, dismantling is one of the possible approaches to designing soil with asphalt. Other projects investigate the potential of experimenting its materiality by playing with porosity, colours, variations of aggregates as the experiences by Topotek, Büro Kiefer, Peg Office, West 8 (fig. 4) –to mention a few– demonstrate. In these cases, asphalt is alive in the multiple behaviours it manifests, in the propensity for versatility.

In conclusion the paradigm of protection that proliferates in recent strategies and policies about soil often reflects a binary vision built upon a dichotomy between natural/artificial, consumed/non-consumed, healthy/degraded soils. On the contrary, a closer look to soils, even the most disregarded, is capable to fade these oppositions. Soils in transition claim for a more comprehensive gaze capable of holding together multiple conditions and finding correspondences (Ingold, 2020) that create relations and interactions between the bodies that inhabit them, whether organic or inorganic (Bianchetti, 2021). In this perspective, soils would not be classified anymore with binary categorisations, but they are synonymous of richness, multiplicity and coexistence (Viganó & Guenat, 2022), thus overturning their actual role in spatial planning: while reflecting the complexity of territories, they represent the common element that weave together different contexts (Mantziaras & Viganò, 2016). To this end, it is necessary to renew the gaze and the way of representing soils by giving special relevance to depth and time, in other worlds, to processes (Viganò et al., 2020). Strategies and policies for transition should be aware of the paradoxes produced by a long-lasting protective attitude and embrace the cognitive change of the paradigm of relations. It is an opportunity to promote new ways of valuing the soil in its entirety, recognising human's potential to create and improve soil characteristics, and acknowledge subjectivity to all bodies that are part of the soil.

The exploration of asphalt soils is a way of dismantling the binary oppositions underlying the protection paradigm, proposing a new set of meaningful categories based on the vitality of matter, behaviours and processes. Asphalt is vibrant matter (Bennett, 2010) that melt and solidify, repel and retain water, fracture and host organic material as a geological horizon. If we recognise to asphalt a proper subjectivity and agency, it is consequent to extend this constant ferment to all the things at this world, finally to the landscape (Metta, 2022). Furthermore, the asphalt lends itself to being a particularly interesting subject for practising re-enchantment as the contemporary premise of any thought of emancipation (Bussoni, 2023). If it is true that the battlefield is the same as the one in which the narrative that has produced disaster worlds operates, then we find the alternatives all around us (ibid.). It is a matter of taking on different looks and postures. Asphalt is clearly linked to that narrative. This is why allowing oneself to be re-enchanted with asphalt can be a powerful tool for reassembling and making worlds.

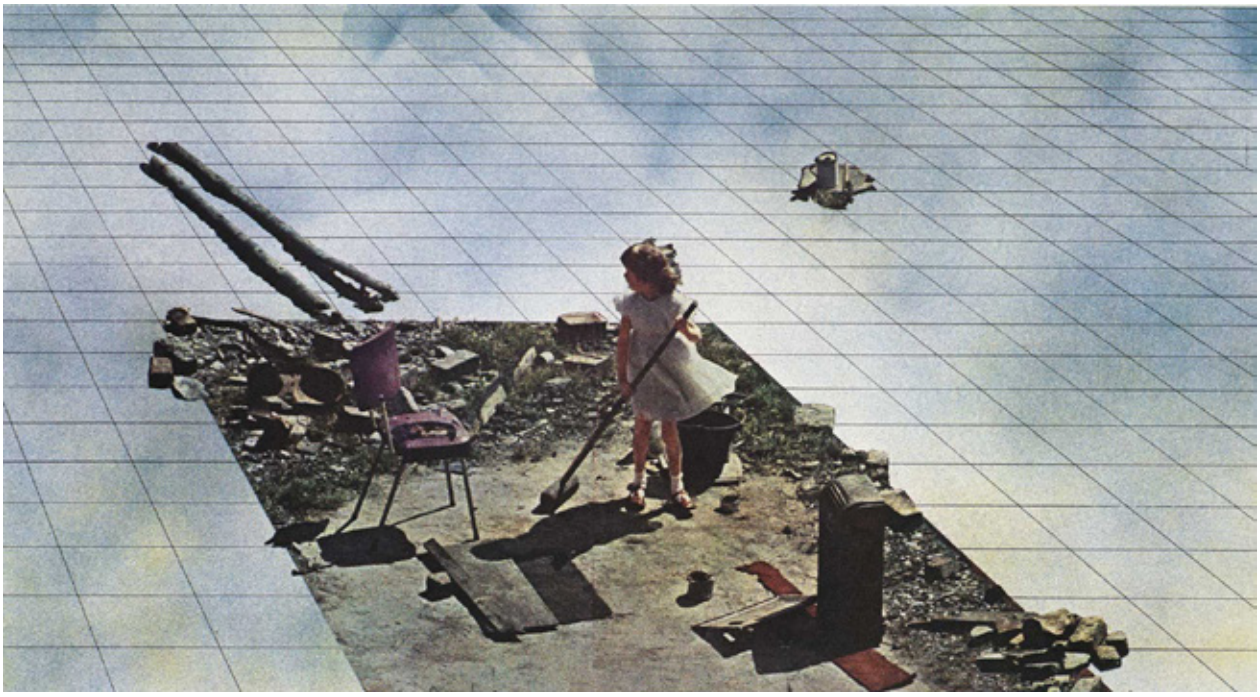

fig. 1. Superstudio, Atti Fondamentali, Vita Superficie, 1971. Credits: Image courtesy of Collezioni MAXXI Architettura, Roma..

fig. 2. Piece of asphalt gleaned in Rome on 17th October 2022. Credits: Federico Broggini.

fig. 3. Jardins des Joyeux, Wagon Landscaping, 2015. Credits: Federico Broggini.

fig. 4. West-Jaarbeurs square in Utrecht, West 8, 1999. Credits: Image courtesy of Jerven Musch.

ENDNOTES

①: To mention some of them in the European context: at the city scale Grand Paris (2008), Bruxelles-Métropole 2040 (2010),), Grand Genéve 2050 (2018), at state scale Green New Deal (2008) Luxembourg in Transition (2020), at political union scale No Net Land Take by 2050 (2016), European Green Deal (2020), EU Soil Strategy for 2030 (2021).

●: According to the EU Soil Strategy for 2030 the ecosystem services consist in: provide food and biomass production; absorb, store and filter water; provide the basis for life and biodiversity; act as a carbon reservoir; provide a physical platform and cultural services for humans and their activities; act as a source of raw materials; constitute an archive of geological, geomorphological and archaeological heritage.

●: To mention the principal monitoring program: Corine Land Cover inventory initiated in 1985; the most recent and important reports about soil sealing are: Guidelines on best practice to limit, mitigate or compensate soil sealing (2012), and In-depth Report: Soil Sealing (2012) both published by the European Commission.

④: In Switzerland the *Loi Fédérale sur l'Aménagement du Territoire* (adopted in 1979) encourages an urbanisation toward the inner areas of the cities to prevent soil consumption, the PNR 22 "Utilisation du sol en Suisse" (1991) and the PNR 68 "Utiliser la resource sol de maniére durable" (2013-2017). In France the Plan biodiversité makes the fight against soil artificialisation a major focus through the ZAN (Zéro Artificialisation Nette) initiative. In Belgium the government of Wallon region is promoting the Stop en béton 2050 initiative in the context of the territory development plan.

●: Soil4Life is part of the European program LIFE which aims to finance projects for the environment and climate action in the context of European Union. Available at: https://soil4life.eu/il-programma-life/

●: In turn Brenner and Schmid move on from the reflections of the French philosopher Henri Lefebvre elaborated in his book La révolution urbaine (Lefevbre, 1970).

●: Corine Land Cover inventory is an example of this type of representation. It should be noted that not only the majority of urban planning consider urban soils as mere surfaces, but in the same way also agronomy represents them as blind and homogeneous spots on the map. Among several examples see "Carta dei Suoli del Comune di Roma in scala 1:50.000" a cura di Antonia Arnoldus-Huyzendveld (2003).

●: For the purpose of this contribution I will appeal to Carlo Giavarini's nomenclature, who uses asphalt to mean the bituminous conglomerate made of bitumen and mineral matters used for roads and paving, bitumen to mean the hydrocarbon compound that is black and viscous in appearance, whether found in environment or obtained to distillation of crude oil (Giavarini 2011).

●: The size of the aggregates varies from less than 1 mm (sand) up to 32 mm: https://www.superbeton.it/inerti/aggregati_asfalti/.

⑩: The size of the aggregates can affect also the penetration degree, that is the porosity, of draining asphalts.
⑪: In this regard, look at the famous pitch experiment (Edgeworth et al. 1984), when a quantity of pitch was poured through a funnel in 1927: the first drop fell after eight years. Pitch is a different material from bitumen, as already mentioned, but the two have a similar viscosity coefficient.

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PART IV: SHIFTING WATERSCAPES

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In the framework of the collision between urban planning and ecosystem dynamics, water emerges as a pivotal protagonist from its origins.

Due its dynamic and pervasive nature, an element intersecting all facets of the territorial domain, the integration of water as a variable within urban planning becomes imperative across diverse scenarios. This integration positions water along a decisive factor in addressing the transitions inherent in urban landscapes, a principle underscored by the collection of papers herein, collectively scrutinising the multifaceted dimensions of water and its role in transition. Such positions recognize the need for a re-description of all-things-water beyond a techno-scientific ontology emerging from the established failing to over-control. Water not only sculpts the topography as it descends but also intricately interacts with the anthropic environment. Perspectives may be adopted from multiple angles, such as the potential inundation of specific regions, or from considerations involving the supply chain and the restoration of ecosystemic balances through meticulous water quality management.

Uncovering these hydrosocial territories as places where socio-political tensions weaponize water through the act of territorialization urges unpacking and deconstruction. Such urgency pushes the process of necessarily re-discussing relations, lifelines and interdependencies within water-based territories. On multiple levels, new methodological approaches are offered to establish future design guidelines by focusing on the availability and origin of local water resources; public goods, as the coastal surface, are reframed as intermediate spaces that require alternative modes of design and management by putting at the core of the agenda the socio-ecological transition they embed; finally, the spread attention to water sensitivity require the necessary involvement of diversified actors and the consideration of alternative infrastructural systems. In contrast to the conventional approach of managing water through extensive infrastructures rooted in a hydrophobic paradigm, contemporary strategies lean towards trans-locality. Herein, water management transcends the status of waste to emerge as a fundamental resource crucial to the intricacies of urban dynamics and, above all, the equilibrium of the territorial fabric. As the primary focus remains on the present, the validation of the study and contemplation of diverse historical periods serve as invaluable instruments.

The examination of territorial diversity within the papers presents a holistic perspective on transition specific to each location. Distinct climatic conditions and urban characteristics wield a significant influence on the behaviour, utilisation, and management of the water cycle. Brussels' precipitation pattern is juxtaposed with the adaptability of the Neapolitan coastline, the urban rivers of Barcelona flow and connect with the sub-watersheds of the Congo River, collectively contributing to a nuanced and dispersed understanding of 'transition' in a wide set of environments.

Together, the set of contributions summarised in the following chapter present an in-depth exploration of the role of water within the intricate tapestry of urban landscapes.

As articulated by the diverse perspectives, the narratives are steeped in transition exemplifying water's transformative agency as a determinant in the evolutionary trajectory of our cities. These practice-based and situated ideas call for a renewed attention to trans-locality. "Down-stream Urbanity" proposes the exploration for a set of guidelines to lead urban growth in contexts where city expansion is not considered an emergency yet. Emphasising the importance of integrating ecosystemic principles into metropolitan planning, the study proposes a new methodological approach centred on local water resources to inform future designs. "Right to the Sea" spotlights the importance of bottom-up reappropriation actions and experimentation with different management forms. The involvement and self-organisation of inhabitants become the pivotal input for collectively-managed regeneration. "Brussels is Leaking" employs cartographic experiments and site descriptions to spatialize hidden water urban infrastructures revealing the role of alternative drainage systems in the city of Brussels. "The hydrosocial territory of the Bumbu valley, Kinshasa" investigates how stormwater is managed through the means of conventional physical and social infrastructure giving particular attention to a third, hybrid and intermediate dimension, that of self-help.

The advanced paradigms shifts, accentuating the significance of localised water resource management, challenge conventional hydrophobic approaches. It repositions water not as a mere byproduct but as a pivotal resource shaping urban dynamics and territorial equilibrium. These studies, acknowledging the multifaceted dimensions of water, from historical relevance to contemporary interactions, lay the foundation for a more holistic comprehension of urban transitions. They advocate for a harmonious design ethos with nature, an appreciation for the subtle gradients of moisture, and a steadfast embrace of the continual process of transition that defines our symbiotic relationship with water and the urban environment. In embracing these principles, a trajectory toward sustainable and resilient urban futures is embarked, where the fluidity of water assumes a guiding role in the collaborative shaping of our cities and the territories they inhabit.

16 DOWN-STREAM URBANITY

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This paper aims to contribute on the exploration of the relation between the management of the water cycle and the scale of the urban fabric.

Considering that in our context the growth of the city is not an emergency, and the challenge remains in the adaptation of our built environment to its local cycles, it addresses the need of establishing a set of principles to promote its transition. While this ecosystemic principles are common at the masterplan's scale, and in the local scale projects, they are often set aside when discussing metropolitan fragments. Through the analysis of a specific case study located at the Barcelona Metropolitan Area, this research seeks to unveil a new methodological approach to establish future design guidelines by focusing on the availability and origin of local water resources.

16·1 WATER FROM THE URBAN FABRIC SCALE IN THE METROPOLITAN AREA OF BARCELONA

The study of urban environments based on the dynamic decomposition of their cycles unveils new perspectives related with the urban project dimension. In this context, the water cycle is a particularly revealing element, that connects anthropic parameters of consumption with territorial dynamics.
This research explores how the study of water management in a specific urban environment arises new strategies to address urban projects, conceived as a new gaze at what exists to reveal alternative perspectives, in this case along the final stretch of the Llobregat river.
Although it is based on a specific case study, the process is understood as a generic methodology, which can be applied in multiple circumstances, starting from the dialogue between two scales of work, the territorial one and that of the urban fabric. Following the principle of McHarg's "Least work solution" (Bryand, Turner, 2019), this approach focuses on the local dimension of water and not the metropolitan one.
Based on GIS technology, drawing is used as a tool to explore the water cycle and define its urban and territorial dimension.
The water cycle within the Metropolitan Area of Barcelona has been a widely studied and documented subject throughout the city's history. At the beginning of the 19th century, geology (Almera, Comas, 1880) (related the behaviour of water and the effect it had on urban growth and the constitution of the territory, anticipating later studies that would relate the behaviour of water and the remaining infrastructure in the construction of the Llobregat delta territory (Eizaguirre, 1994). Water cycle has been continuously studied and evaluated by the Metropolitan Area of Barcelona (Area Metropolitana de Barcelona, n.d.), focusing into specific parameters of consumption, cycle, and integration into the urban fabric. However, most of these approaches are carried out from the point of view of the infrastructure network management, paying attention to the processes of supply, sewers, treatment, or control of floods, without relating it to urban morphology.
On another scale, there is a very wide range of projects that, from the public space perspective, deal with the integration of the water cycle in urban environments. Yet, this research aims to focus on an intermediate scale, that of urban fabrics, to explore the relationship between urban morphology and the water cycle (Ranzato, 2017), detaching itself from the metropolitan infrastructure network, neither focusing only in specific public space projects. There are examples of the application of this approach in other aspects, such as the coastal front (García García, 2017), but in this case the gaze is directed towards the traces that have historically defined the relationships along the plan of Barcelona, the streams that connect the mountain with the sea.

16·2 TWO DIRECTIONS OF WATER AND TERRITORY

The movement of water unveils the morphology of the territory, however, depending on its origin, two flow directions can be established that reveal two different realities, both embedded within the same cycle.
The main and most obvious is the waterflow from the Llobregat River [fig.1] that collects rainwater along its 494.856 ha basin and flows along its course, defining a series of areas parallel to the river's way: the riverbed, the floodable area and the aquifer and the delta. A fourth layer of anthropic origin is the network of irrigation canals that accompany the final stretch of the river and delimit the productive fields of the Lower Valley and the Llobregat's Delta. The construction of multiple infrastructures along the valley have modified the originally floodable soils, altering the original logic of the territory (Crosas, Martí, 2021).
The second dimension of water is the one that has its origin in the perpendicular courses to the river axis, defined by the multiple streams [fig.1] that lead the precipitation from its reduced local basins in the coastal range towards the final stretch of the river or directly to the sea. Instead of a set of overlapping areas parallel to the river, the territory is segregated into a collection of perpendicular sub-basins defined by these courses.
Focusing into the local dimension of water, one of these sub-basins is established as a case study, defined by a set of urban fabrics and open spaces that define the layout of this axis.
Considering the modification of floodable surfaces due to the construction of the territory, a necessary preliminary step to carry out is the updating of the stream map. The original one is obtained from the Catalan Water Agency (ACA) cartography, and it displays the original traces that led the water from Collserola towards the sea. Urban growth has often buried and integrated these watercourses into the sewerage network, even though in many cases they continue to determine the layout of certain streets and remain in the local toponymy. Focusing on the constructed city (understood as a volume of buildings, infrastructure, and open spaces), from the digital elevation maps of the land, the "topographic wetness index" (Grabs et al., 2009) detects the locations most likely to accumulate rainwater and reveals the current water path [fig.1] over the contemporary city. In this context, the anthropic modification of water courses is not an unexplored topic, as the final stretch of the river was artificially deviated to allow the harbour's consolidation back in 2004 and integrated into the Delta ecosystemic structure through a project led by the landscape office Jansana, De La Villa & De Paaw Architects.
A case study is selected from the basins defined by the corrected water topography. The area is defined by two streams, Gornal and Creu [fig.2]. It is composed by 459.2 ha and includes three municipalities, Hospitalet de Llobregat (mainly), Barcelona, and Esplugues de Llobregat. It starts at the foot of the Collserola rage and drains towards the sea, although in this case the limit of the basin is made by the infrastructure of the Coastal Ring (B-10), which acts as an interceptor element of several of the existing water courses and leads the water to the harbour.
It is an area that encompasses multiple urban fabrics [fig. 3], from the garden city of Finestrelles, the UB sports campus, the Collblanc

neighbourhood, the centre of Hospitalet de Llobregat, the Pl. Europa and Fira area, and the Zona Franca industrial estate.

16·3 THE ORIGIN OF WATER

This heterogeneous set of urban fragments entail a multiplicity of uses for the rainwater harvested along its course. Through the depiction of the way how water interacts with each area, a set of diverse layers are analysed and categorized as follows:

1. Origin of water. In this case is only considered rainwater as a source. Atmospheric precipitation - An annual rainfall of 600 mm is considered, as well as a design rainfall of 59 l/h.
2. Surface on which it precipitates. It can be rather pervious or impervious.
   2.1 Impervious
   2.1.1 Buildings: they intercept the water and lead it to the general sewerage system. However, this water can be reused following the principles "of fit for purpose", depending on two variables.
   2.1.2 Residential density - Local studies determine that depending on a minimum residential density parameters (Number of homes/building) local grey water utilization systems can be considered (Ajuntament de Barcelona, 2009).
   2.1.3 Occupation – Plot space not occupied for building can be used as land for storage, infiltration or to exploit productive and recreational uses of water.
   2.1.4 Open space – These areas intercept and conduct water. The discontinuous pluviometry regime typical of the Mediterranean landscape allows the alternation of retention systems for the prevention of sewer overflow with public uses.
   2.1.5 Streets: The connecting role of the streets makes them key elements for the conduction of water as well while they also allow the easy implementation of filtration treatment systems (which require this dynamic condition).
   2.2 Pervious
   2.2.1 Plot free space – The space that results from the non-occupation of the building.
   2.2.2 Open space – Gaps between urban infrastructures or large met ropolitan parks, which act as collectors of rainwater, softening its runoff, and enhancing its infiltration.
   2.2.3 Permeable public space – Spaces that allow the infiltration of water into public space, while they stimulate vegetal growth in urban environments.

16·4 LAYERING THE CONTEXT

The defined parameters are directly related with the built environment, and therefore, a spatial dimension that can be mapped. These new cartographies permit to build a water atlas that provides a new perspective on the contemporary city.

16·4·2 Surface and underground water

A necessary preliminary step when evaluating the infiltration capacity in the subsoil, is to classify and distinguish the various layers that conform it [fig.2]. The selected case study presents three large areas, with different qualities of infiltration, and which constitutes a rather illustrative example of the territorial reality of the city of Barcelona and its surroundings. It is a city bounded by the sea, the Collserola mountain range, and two deltas. This fact implies that through the perpendicular cross section three types of soil are found, the rock of the mountain, the sands of the Barcelona plain area and the clays of the delta. These last one overlaps with an underground body of water, the Llobregat Delta Aquifer, which is a source of metropolitan supply. The aquifer also plays a key role in the ecosystem balance of the area, as it prevents saline intrusion from the sea and preserves the productive capacity of the Delta's soil. These three large areas define whether infiltration is necessary, being impossible or very difficult in the upper section, possible in the two lower sections, but especially important in the final section, to recharge the aquifer. The multiple ground coverage typologies, involving different degrees of rainwater pollution, together with the presence of extraction wells and the port activity, unveils a sensitive scenario above and below ground level. In this context, the location of open and permeable areas at the local scale where clean water can be infiltrated becomes essential.

16·4·3 Surface water and density

The water that falls on private plots is usually conducted to the sewer system, but it can potentially be reused following the principles of "fit for purpose" depending on two parameters, occupation, and residential density [fig.2].

From the point of view of residential density, the central section of the area, corresponding to the neighborhood of Collblanc, the center of l'Hospitalet de Llobregat and Plaça d'Europa area, have fabrics with enought density that the implementation systems of gray water upcycling are economically available (Martí, Crosas, 2022). That would mean a considerable discharge of the sewer system, at the same time led to a scenario of excess treated water being directed towards the public space where it could be filtrated.

The intensity of occupation tends to coincide with the residential density, being the fabrics with the highest population those with more compact buildings and, therefore, with less available space on the plot to infiltrate or treat rainwater. The lowest occupations are found in the garden city, where, due to the morphological characteristics of the urban fabrics, few inhabitants enjoy a large surface of available land, enhancing the possibility of managing the cycles and improving the ecosystem independently,

inside of each plot. Another interesting area from this point of view are the industrial plots, which also enjoy large empty spaces inside and have large roof surfaces to harvest, enabling the interception of rainwater along an area where it is particularly important to enhance infiltration

16 · 4 · 4 Waterways and the city

The streets that connect and structure the metropolis play a key role in the conduction of water throughout the territory (Viganó et al., 2016). However, these are contaminated surfaces that require prior treatment. Within the area studied, the slope of the street network reflects the geological composition of the soil, being steeper in the upper rocky part, moderately inclined in the middle, and practically flat in the final stretch [fig.2]. By eliminating the main connections which accumulate the highest traffic density, defined as structuring axes, a set of interesting streets appear both in the upper and the central areas, where their slope and the low volume of vehicles allow the implementation of filtration systems, which lead the water captured to the higher area through vegetated strips and bioretention frames, in order to supply the lower area with treated water suitable for underground infiltration or its reuse for urban demands.

16 · 4 · 5 Water and open spaces

Open spaces play a key role in the management of urban cycles (McDowell, 2017), understanding them as land which is not intended for building or occupied by road infrastructure, and therefore, can become a connector between the subsoil with the surface and the atmosphere [fig.2]. These surfaces enhance the relationship between the urban project and water based on the compatibility of their uses. In contrast to the case of the streets, which are related to the movement of water, open spaces exploit its static condition, favouring collection, retention, storage, or infiltration. In the case we are dealing with, the open spaces are particularly present in the upper section of the area.

16 · 5 VERTICAL CONNECTION

By the areas contrasted through the depiction of the multiple layers, 6 sub-regions are defined. Those are the garden city, the open spaces, the compact city, historic centre, open city, and Industrial estate. Besides its differences, they share a common watercourse which connects them all. Through the analysis of the needs and characteristics of each area, they can have specific hydric demands (Cavalieri, Vanin, 2019), but the interest remains in how they can benefit due to its friction [fig.4].
From a general and simplistic point of view, considering private parcels as catchment areas, the potential amount of rainwater that can be yearly harvested is calculated. This rainwater could be potentially integrated in the water cycle instead of the pipe water used as grey water, following the “fit for purpose” principle. Considering the variation of densities along the different sites, and its total parcels area, each urban fabric can harvest enough grey water to supply the next one [table 1]. This scenario is merely theoretical, as its not possible to implement such a system in the existing

city due to the economical and physical effort that would be necessary to carry out. Nevertheless, the previous calculation unveils the possibility of establishing a set of different strategies to lead the transition to the upcycling of a local-urban basin through its water cycle.
Based in the urbanistic and morphological conditions of each urban fabric, six water-related strategies can be implemented:
1. Detention – Multiple private areas, such as roofs and impervious open surfaces are currently intercepting rainwater and flushing it to the sewage system, where it could be easily upcycled.
2. Retention – That collected rainwater can be harvested in the multiple open spaces.
3. Filtration – Sloped non-principal streets can easily integrate natural-filtration systems like vegetated strips along their course.
4. Infiltration – Pervious available spaces, such as open spaces or private parcels can integrate infiltration systems such as SUDs, in the case that soil characteristics allow it.
5. Treatment – Impervious open spaces or areas where filtration is not possible due geological conditions, can host vegetated ponds, that statically treat the water collected before it is moved down-stream.
6. Production – Dense neighbours with multiple-apartment buildings become great opportunities to implement grey-water local systems, and its leftovers could be re-integrated into the local urban-water cycle, providing a continuous water supply that ensured re-greening strategies of those areas.

16·6 LEADING TRANSITION FROM URBAN LOCAL-BASINS

This collection of strategies does not seek to implement a masterplan, but aims to establish a set of guidelines for future urban interventions. Through the understanding of urban dynamics and intrinsic hydrological conditions of their multiple local-basins, the continuous process of urban re-construction must be coherent with the transition to local-based solutions. The challenge remains in finding the most accurate dimension to that local condition. Though this research, the detection of multiple urban sub-basins where its intrinsic hydric resources can connect multiple urban fragments following water dynamics, unveils the opportunity to connect the future interventions in the city [fig.5]. Understood as both the promotion of urban interventions and the drafting of urbanistic regulations, urban design plays a fundamental role in the lead of this proposed transition. Considering that climate change is altering the rainfall regime, increasing both the intensity of rain episodes and lengthening drought periods, the adaptation of urban environments for the local management of water cycles becomes a key element to guarantee its resilience.

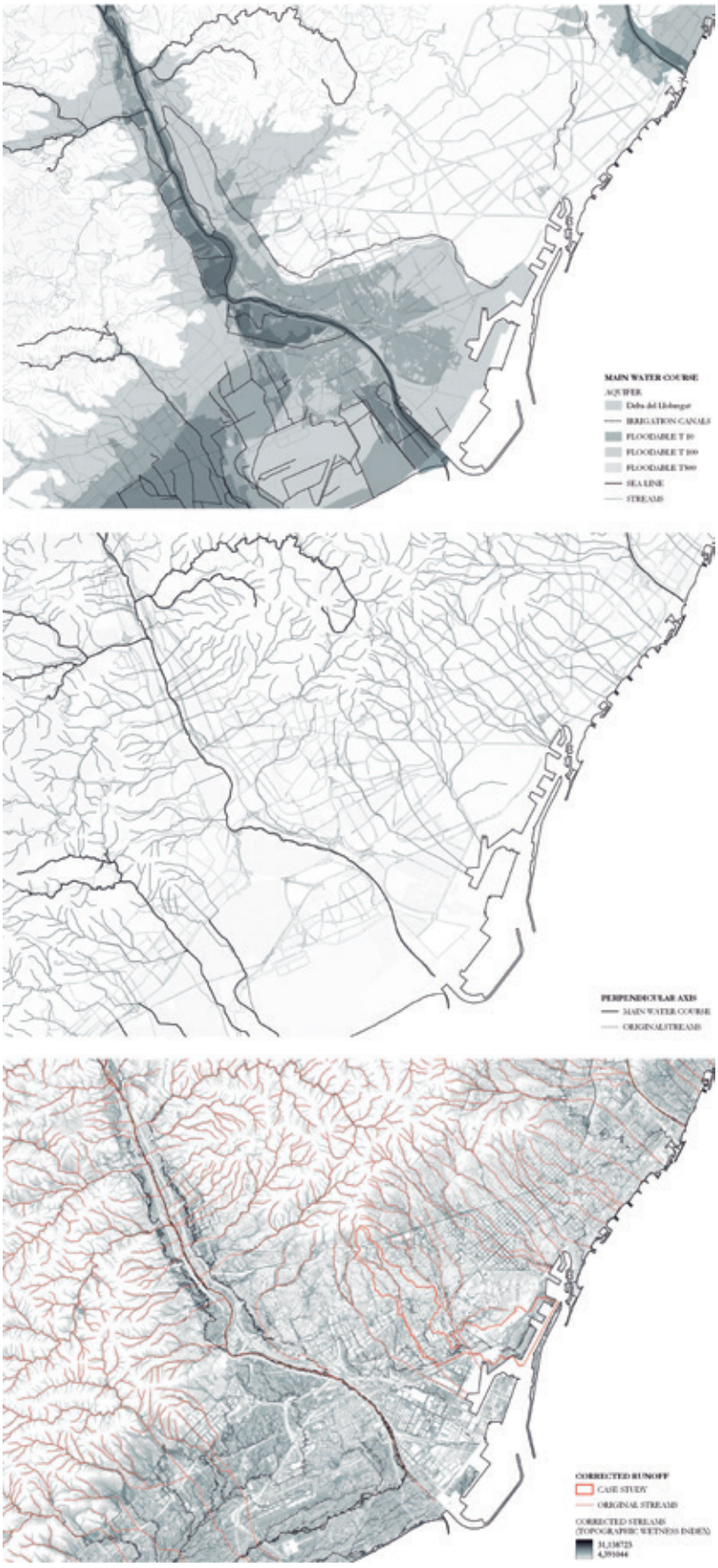


fig. 1. 1/ Main water course. 2/ Perpendicular courses. 3/ Corrected runoff through topographic wetness index. Elaborated by the author. Data from the Institut Cartogràfic i Geològic de Catalunya (ICGC), Catalan Water Agency (ACA) and Mapa Urbanístic de Catalunya (MUC).

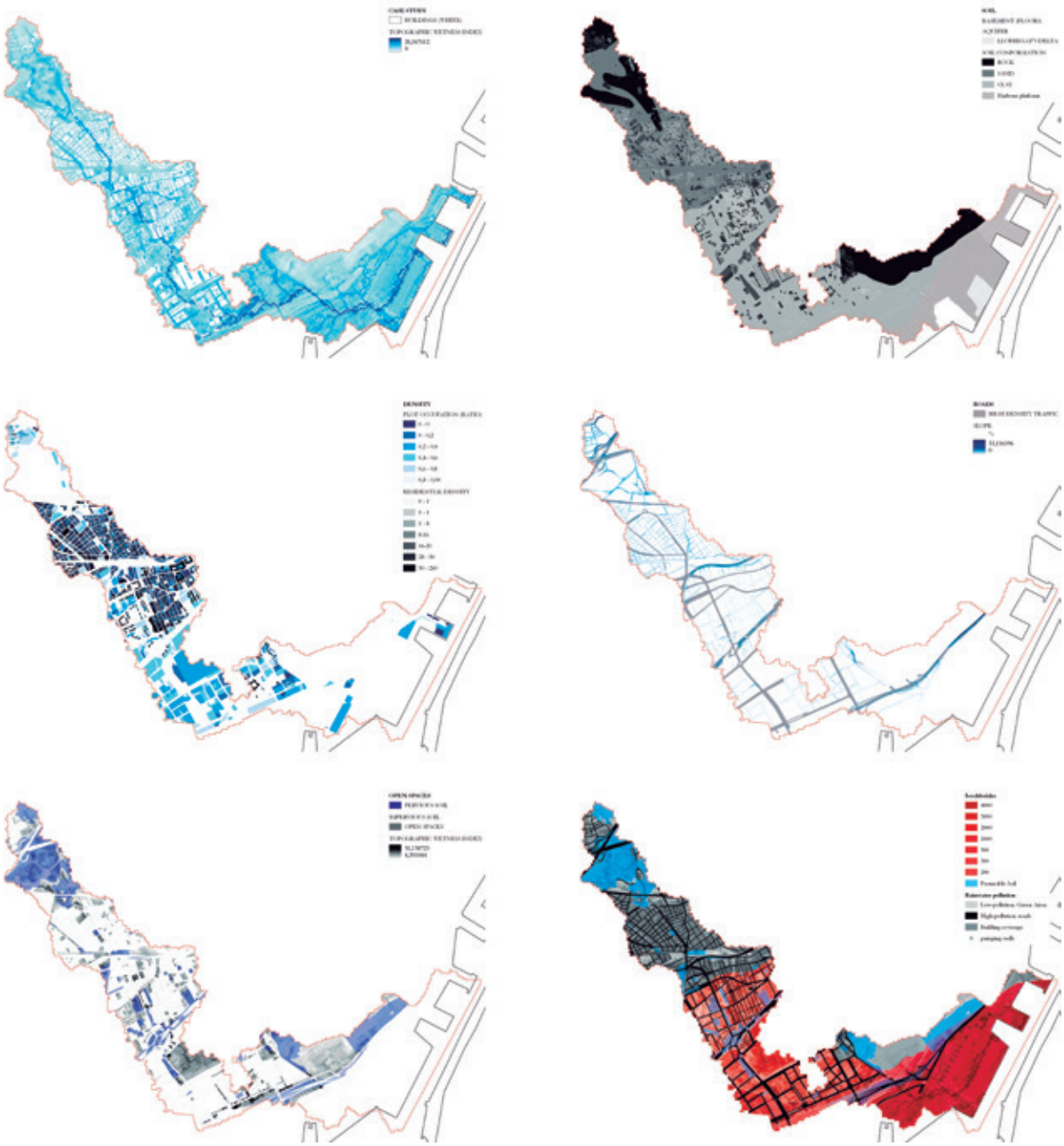
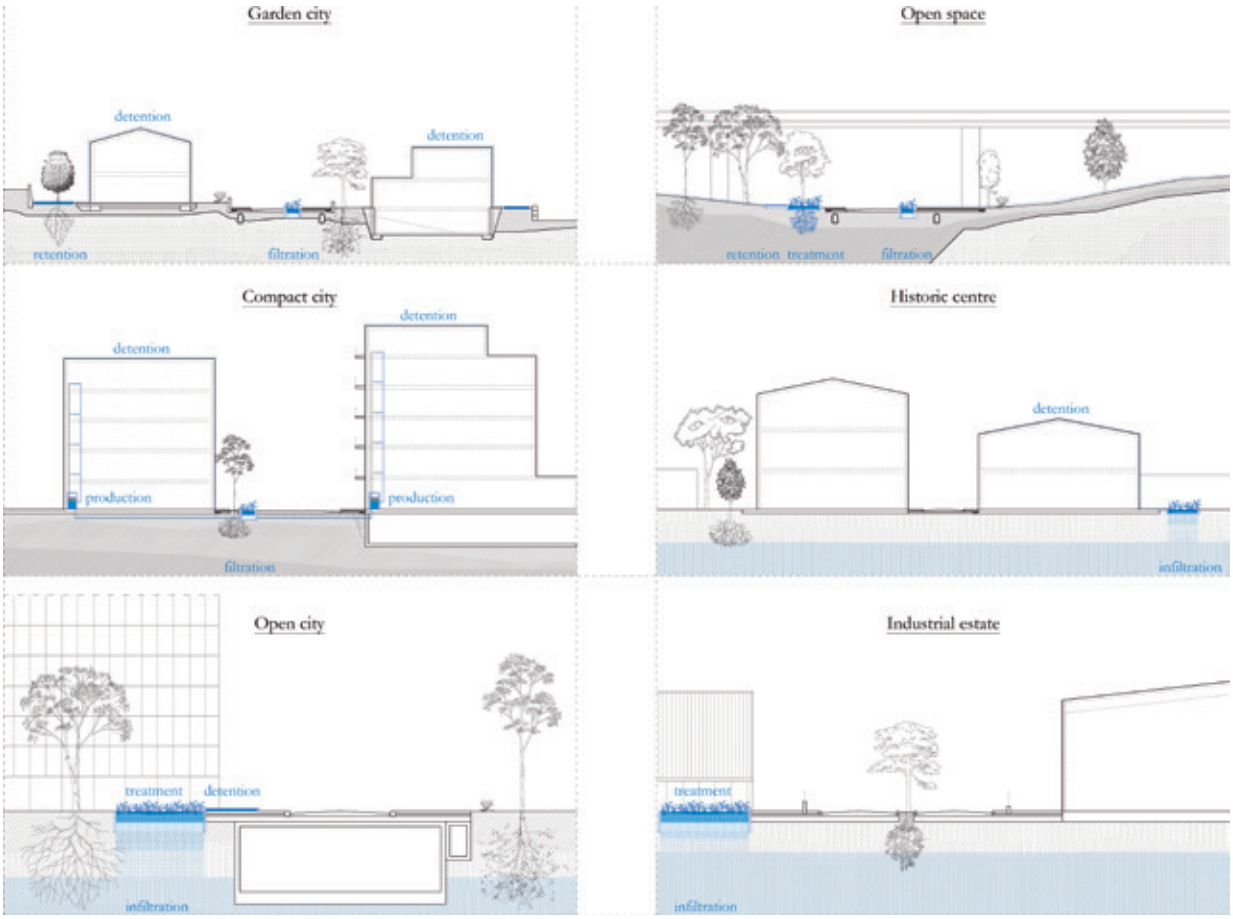


fig. 2. Up-left - Case study. Up-right - Soil Typology. Mid – left - Residential and occupation density. Mid – right - Streets and Slopes. Down – left - Open spaces structure. Down – right - Water quality. Source - Elaborated by the author.

fig. 3. Urban fabrics along the local watercourse. Elaborated by the author. Images from Google Street View (2023).



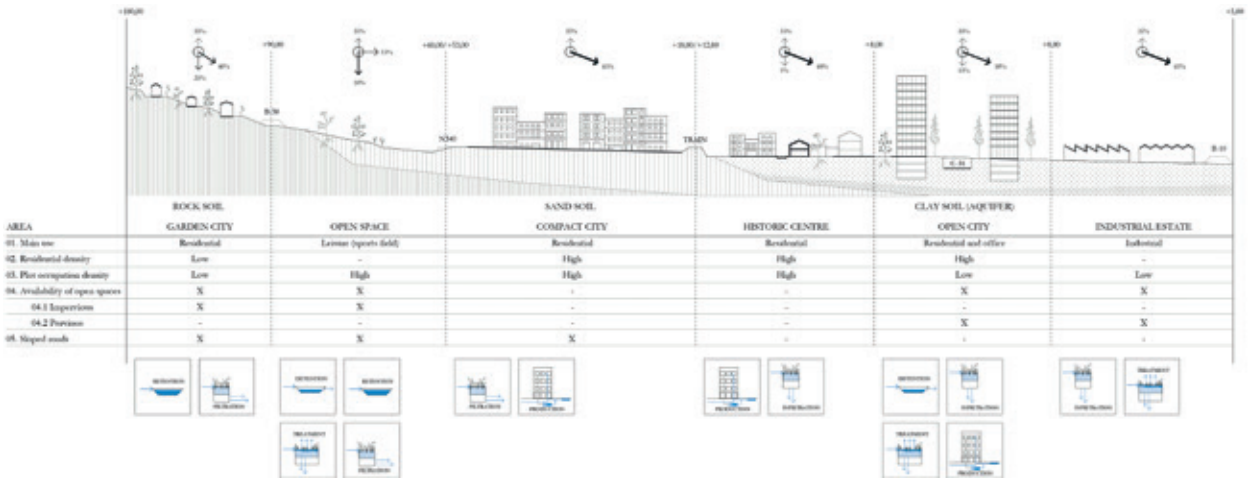


fig. 4. Basin section, hydric attributes and potential interventions. Elaborated by the author.

tab. 1. Water consumption and potential rainwater collection along the urban basin. Elaborated by the author.

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17 RIGHT TO THE SEA. THE COAST AS A LANDSCAPE IN TRANSITION TO BE RECLAIMED

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The concept of transition has gradually pervaded the public debate related to coastal territories, identifying itself as a political, economic, and social paradigm of reference.

It is understood as the evolution of a system in crisis toward new balances to face contemporary challenges. In particular, the paper understands transition as an interpretive lens by examining the multiplicity of meanings it takes on in coastal territories. On the one hand, the coast is identified as a transitional area between land and sea, in which the land-water logics constantly seek balance. On the other, the coast is identified as a landscape in transition that recognizes a change taking place and defines a condition of suspension. Starting with the Neapolitan case, the paper reflects on the possibility of recognizing the coast, fragile and public good, as an intermediate space to be designed and managed with alternative models, with a view to a socio-ecological transition.

17·1 TERRITORIO-MARE AS A TRANSITIONAL LANDSCAPE AND ITS VARIABLE THICKNESS

The concept of transition has gradually pervaded the public debate related to the urban planning discipline, identifying itself as a political, economic, and social paradigm of reference. It is understood as the evolution of a system in crisis toward new balances to meet contemporary challenges. This process has become a paradigmatic concept in the definition of development strategies in different areas and levels of policy. The social-ecological transition is embedded within two issues: the transformation of living patterns (and land-use models) and a balanced distribution of the costs involved in this transformation among the different social groups and territories involved.

Concerning coastal territories, the transition is identified as an interpretive lens with double meanings. Indeed, on the one hand, the coast is an area 'of transition' between land and water, the threshold point between the city and the noncity. According to this interpretation, the coastline is a dynamic and ever-changing area characterised by complex interaction phenomena between the terrestrial and marine environments, in which land-water logics constantly seek balance (Bertoncin, 2008).

On the other, the coast is an area 'In transition' that recognizes a change in progress and defines a specific condition of suspension. According to this declination, transition indicates a shift toward an arrangement that focuses on the ability to cope with some challenges central to our contemporary times, reconfiguring goals and reformulating the project. In this sense, reference is made to that whole set of actions that can no longer be procrastinated or generalized, which determines a necessary innovation in the way of looking at the issue of the design of the city-sea relationship along coastal territories.

Looking at the coast through this dual lens leads to an overcoming of its original meanings, identifying it as a relational sphere with varying depths. It transforms from "line" into thickness between the city's geometric rules and the changing space of the natural landscape, overcoming the dichotomous land-sea distinction and introducing reasoning about a different representation Defined as the area of the earth's surface where land and sea meet (Carter, 2017; Vies, Spencer, 1995), the coast is identified as a changing fluid space influenced by the interaction of different degrees of anthropogenic and natural pressure.

Therefore, the coast is considered a section of land whose geometry depends on different gradients of wetness (Da Cunha, 2010), a space of interaction with different spatial boundaries in a continuous overlapping of possible limits. Recalling Berger (2007), this territory describes a state of liminality, something that lives in transition and eludes all classification but which constantly instigates change, the search for a new balance between the parts.

The current condition of ecological, social, and economic transitions requires building a new adaptive and resilient coastal project and a new approach, defined within the research as "territorio-mare". This refers to the idea of a dynamic coast that looks at the sea as the way the city reinterprets itself. It is also characterised by the intense concentration of

dynamics, pressures, and flows and, in particular, by the use its people made of it (Crosta, 2010).
Looking at the coast from this perspective, attentive to the plurality of practices and the rhythms of the use of coastal space, makes it possible to show its variability and the continuous mutation of its thickness. Thus, starting from the notion of practice as "what people do" and the coast as thickness, the contribution investigates new perspectives through which to orient the transformation of coasts, constructing a shared narrative to be the basis of an adaptive coastal project in a renewed balance between land and sea.

17·2 THE COAST AS A FRAGILE AND PUBLIC GOOD

Coasts, as areas of intersection between the land and the sea, express the intimate relationship between the two elements and are identified as a paradigmatic space for disciplinary reflection. A public good par excellence, a vulnerable and scarce ecosystem, the coast is a fragile transitional thickness, subjected to countless disturbances that have irreparably compromised its balance (Guizio, 2022).
Talking about territorio-mare in transition leads to looking at the coast in its dual dimension of a fragile and public good. Coasts are the areas most vulnerable to climate change and most exposed to increasingly frequent and intense extreme events (IPCC, 2019; Enea, 2020). These fragile goods, as the intersection of anthropogenic and environmental pressures, are places where the effects of climate change will become most evident. That is especially so at the points of major depression, where sea level rise and erosion processes will lead to rather significant geographic transformations, with which the transition project must contend. Coastal strips have undergone substantial pressure due to the progressive proliferation of urbanisation and the conquest of ever-larger spaces by construction, infrastructure, and production or industrial facilities, which have consumed land and stiffened the dynamic land-sea interface (Zanchini, Manigrasso, 2017; Di Venosa, Manigrasso, 2022; Curci et al., 2021). These phenomena have compromised valuable ecosystems and contributed substantially to accelerating the vulnerability of coastlines and coastal communities, which face the effects of sea level rise and the increase of extreme events. Indeed, coastal ones are distinguished as territories exposed to the most radical manifestations of climate change, which has contributed to altering their natural, identity, and cultural characteristics and underscored a global urgency for transformation.
In particular, thinking in terms of thickness, these territories, as the intersection between one system advancing and another forced to retreat, are threatened by numerous coastal hazards: the permanent submergence of large portions of land; enhance coastal erosion (with a significant reduction of beaches) and shoreline retreat; increased frequency and intensity of coastal flooding; salinization of surface water, soil, and ground; loss of wetlands; disruption and permanent change of coastal ecosystems; and impeded drainage (Oppenheimer et al., 2019). The climate change scenario demands urgent planning response transforming the land-sea relationship

and how communities perceive it, addressing resilience to this adaptive socio-ecological system (García, 2023).

Second, the coast can be considered a particular form of public good: the beaches, and in a broader sense, littoral zone, in the context of state property, be part of the category of maritime property and, as such, identified as a public good of collective belonging with high social relevance (Lucarelli et al., 2021).

The historical perspective of this dimension is closely related to a sort of "beach revolution": a qualitative change rather than a quantitative one that sees the beach abandoning its marginal role (linked to the imagery of fear and disquiet) to assume one linked to well-being and leisure progressively. Between the 1950s and 1960s, the progressive attractiveness of the sea determined a shift from elitist experience to mass tourism, leading to the recognition of the coast as one of the main drivers of the tourist economy in Italy. Seaside holidays became more common for a broader population, generating economic growth and numerous dis-values. Due to the consolidation of mass tourism and the expansion of ways to enjoy the sea in various forms, we have witnessed an increasing number of tourist-recreational facilities and a progressive transformation of the coastal landscape. This generated an alteration of the natural dynamism of the coastlines, depleting their natural characteristics.

As an asset belonging to the state, it should be directly and freely usable by the community. However, equity of access to the maritime domain is often not guaranteed, and concessions to private entities are imposed compared to the available coastal area. In recent decades, the surge in the number of concessions for tourist-recreational use and the growth of beach facilities, together with the lack of national indications regarding minimum percentages of beach to be dedicated to free enjoyment, has led along the Italian coasts to contrasting and paradoxical situations in terms of occupied coastline. The combination of these dynamics has progressively taken the coast away from equal enjoyment by citizens, accentuating certain inequalities and identifying the coast as a perpetually contested space: contested in uses, plans, competencies, and tools. According to recent data made available by the Sistema Informativo Demanio Marittimo, beach concessions occupy 43% of Italy's sandy coastline, the percentage of which highlights how just under half of the beaches guarantee free enjoyment of the coastline, penalising its social function (Legambiente, 2022).

Within the recent political debate regarding beach concessions and, in particular, the complex process of Italy's adaptation to the Bolkestein Directive, a collective sentiment seems to be emerging that denounces the monopolistic regime that has characterised part of the concessions system over the past decades. Since 2006, Italy has never formally transposed the Bolkestein Directive (2006/123/EC) ①, which regulates competition and provides for systems to assign the management of maritime state property through transparent and impartial selection procedures in order to protect the depletion of a scarce resource, such as the coast and beach. In many Italian contexts, the failure to comply with the European Directive, the generalised system of extensions, and the mismanagement of some coastal stretches have de facto privatised the state property, removing it from the free enjoyment of the community.

In looking at the coast in the changing climate scenario as a public space of collective belonging, it seems appropriate to reflect on the role of the maritime domain. The two declinations of the coast are strongly interrelated: due to the interaction of progressive erosion, unauthorised development, privatisation, infrastructure, and sea level rise, we are witnessing the disappearance of the state line. In some contexts, the state property dividing line understood as the boundary of the maritime state property with the property of third parties, has been eroded. In others, it has expanded due to sand accumulations. In others, it is no longer there.
The awareness that in most parts of the country, the state dividend is in the water makes us reflect on the need to reconstruct a public domain not only to ensure its accessibility to all citizens but also to recognize it as an intermediate space designed to ensure safety for those who reside near the sea. While there is a need to ensure that a fair percentage of beaches remain for the free availability of citizens, there is also an emerging need to reorder how state property is managed. Concessions are allocated, paying attention to the criteria of transparency, sustainability, and accessibility.

17·3 IN-BETWEEN NAPLES

In this framework, the city of Naples seems paradigmatic to talk about coastal thickness as a public good, to plan to provide security from the advance of water, and to reclaim its use.
Naples is emblematic of its great difficulty in accessing the coast, understood only in fragments (Russo, 2010; Di Gennari, Guida, 2002). Over the years, the shoreline has undergone several transformations that have led to increasing fragmentation, hindering in most of its segments its direct fruition and sometimes even its mere perception. In particular, it presents itself as a denied-sea city because of the constellation of beach concessions that make the only existing tracts of beach and not yet banned from bathing for reasons of pollution, practically private and inaccessible. The dynamics surrounding the management of concessions have generated profound social inequalities and the conversion of public space into a mere consumer good, limiting the portions of free beach and only sometimes guaranteeing the right of way required by law.
As mentioned earlier, the combination of the dynamics has made accessible parts highly restricted by accustoming citizens to experience the sea through alternative practices and uses. The immersion in the Neapolitan context and the direct observation of some transects transversal to the coast, with a double perspective from the land and the sea ●, allowed to intercept the formal and informal practices through which citizens reclaim the right to the sea and redefine the coastal thickness [fig. 2].
The issue of sea usability has been particularly central since June 2022. Primarily, the resolution's approval on "the open and safe management of public beaches" brought attention to the issue. The deliberation, in fact, for some of those few free stretches of the beach, in particular for Donn'Anna and Monache beach in Posillipo, provided for closed numbers and entrance control by the owners of neighbouring lidos. This solicited a great deal of tension in the citizens, which saw the public character of the coastline

impaired and triggered numerous mobilizations through the support of citizen committees (especially Mare libero, Gratuito e Pulito Napoli) that animated, and is continuing to animate, the entire summer season with continuity [fig. 3]. In addition, with the end of the summer season, access to the Donn'Anna beach remained closed with a gate. A 1997 ordinance allowed citizens in the fall and winter period to have access, from 9 a.m. to 5 p.m. to the said beach through a gate operated by the concessionaire of the neighbouring lido. However, the lack of awareness of the ordinance has for years seen the gate close with the end of the bathing season.
In September 2022, through the work of the Mare Libero, Gratuito e Pulito Napoli committee, the ordinance became public knowledge, allowing citizens to demand that the concessionaire open the gate and recover a de facto right denied for over two decades. Within days of the opening, another ordinance was passed ordering the gate to be closed due to hydrological hazards (which was never supported by evidence).
This event led the committee to experiment with awareness and mobilisation initiatives, including an appeal to the TAR made possible by the input of hundreds of donations and a crowdfunding campaign ●, which enabled them to reach the amount needed to file the appeal.
Second, the press review highlighted the different conflicts of stakeholders, particularly between the interests of private concession holders and the protection of the general citizen interest.
Finally, the adoption of the new Piano di utilizzazione delle aree demaniali marittime ④ of the Campania region and the long-awaited transfer of jurisdiction of the coastal tract of the municipality of Naples from the Autorità di Sistema Portuale del Mar Tirreno Centrale to the municipality, have underscored the urgency of the issue in the policy agenda as well. In particular, the processing of drafting observations on the plan by trade associations was an opportunity to build territorial social networks composed of all the associations and committees (working in defence of the sea) of the various coastal municipalities in Campania ●.

17·4 OPEN REFLECTIONS

The Neapolitan experience underscores how a conscious collective consciousness has now emerged to exercise its rights over public property, intending to recognize the social function of the maritime domain.
The paper reflects on the possibility of recognizing the maritime domain as an intermediate space to design to ensure security for those who inhabit territories near the sea, with a view to socio-ecological transition and collective reappropriation of denied tracts of the coast.
The Bolkestein Directive seems to turn out to be a pretext for questioning in urban planning terms a scarce asset but, above all, for defining a project of coastal reform with concessions that also take on planning from a socio-ecological perspective while recognizing the beach as a public good.
In this sense, especially in a context as complex as the Neapolitan one, there emerges the need to "restore dignity" to the assets of collective belonging, ensuring that a fair percentage remains outside the logic of the market, experimenting with other forms of management through the

involvement of associations, non-profit organizations or the third sector. Within the Discipline introduced by the new PUAD there is the provision of areas of unrestricted use to the extent of no less than 30 percent of the length of the strands and 30 percent of other state-owned surfaces usable for bathing purposes. This percentage does not represent an adequate balance between available and concession areas and does not consider homologous stretches. In addition, the plan has a purely touristic and economic lexicon and, in terms of participation, always refers exclusively to trade associations without ever mentioning citizens' associations or committees working in defence of the sea.

The search for a new balance between the city and the sea can start with bottom-up reappropriation actions and experimentation with different management forms, where the involvement of inhabitants can become an opportunity for collectively managed regeneration. The building of social networks and citizen mobilizations are therefore identified as a graft for reclaiming the right to the sea.

The reading of informal practices and the narrative of ongoing mobilizations lead to a reflection on the possibility of recognizing the coast, because of its usefulness for the benefit of the community, as a commons, allowing it to fulfil its social function in terms of usability, that is, restoring to it the nature of an asset of collective belonging.

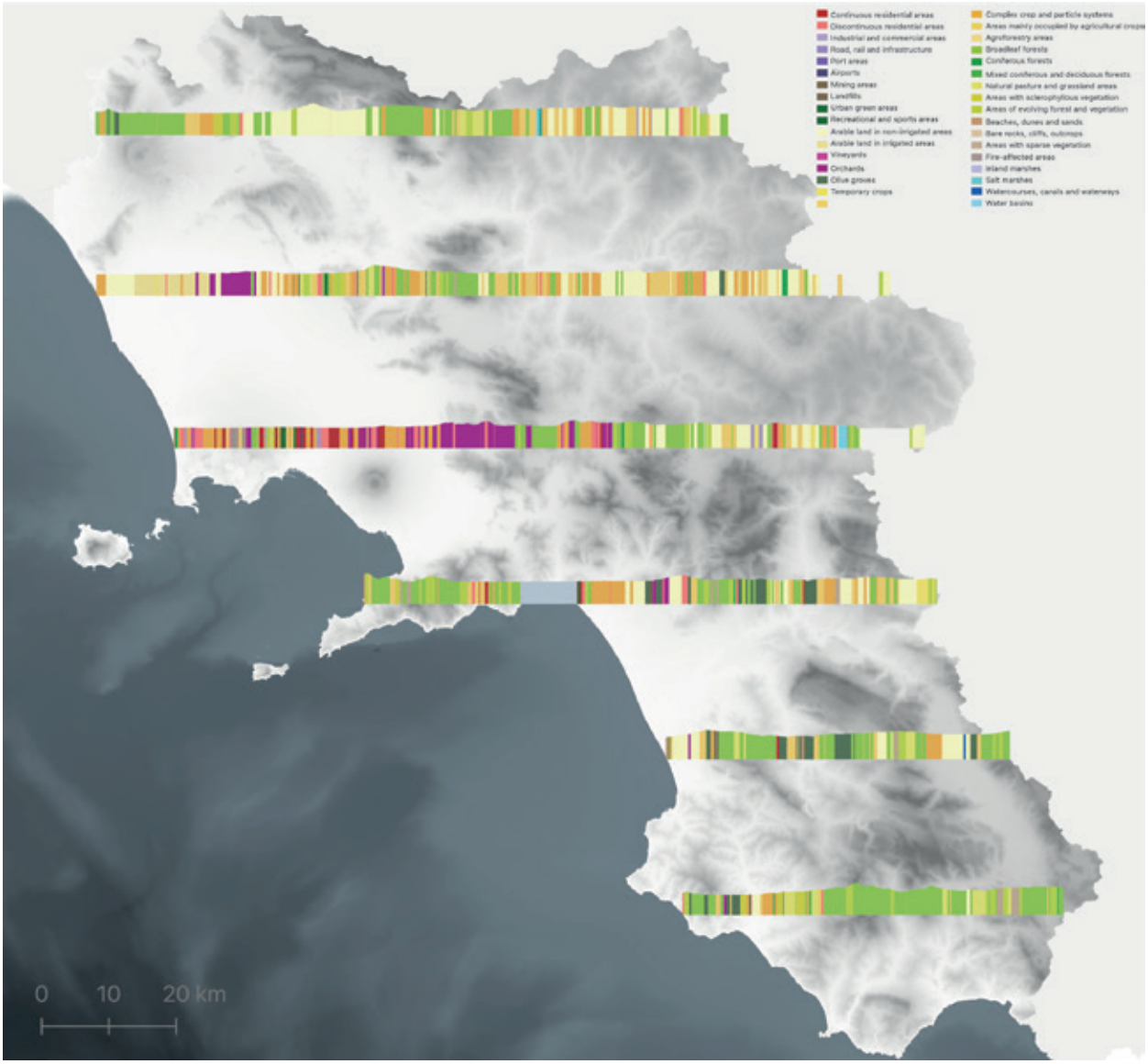

fig. 1. Coast as variable depth thickness of different gradients of wetness. DNA thematic sections showing the predominant components of land use in the Campania land-sea interaction. Elaborated by the autor.

fig. 2. Fishing in the new skyline: when the informal reclaim what the port denies (Photo by K. Pica, 2022; article by A. Lucarelli "Il diritto al mare nell'agenda degli aspiranti sindaci" in Repubblica Napoli 05-08-21).

fig. 3. Naples - On July 1, 2022, the Mare libero Napoli committee organised a mobilisation in Piazza Municipio for unrestricted access to the sea, following the City Council Resolution establishing a closed number for some public beaches, subject to reservations and under the control of private managers. (Photo by K. Pica, 2022; article by A. Lucarelli "Posillipo la spiaggia vietata di Donn'Anna" in Repubblica Napoli 5-12-2022).

ENDNOTES

①: The directive specifically on services in the internal market lays down provisions on the free establishment of service providers and free movement between Member States.
●: The research used walking along a transect as an exploratory device to observe and investigate the land-sea relationship. The direct experience from the sites made it possible to intercept the transition processes and to measure "how deep is the coast" in terms of different gradients of wetness. In particular, the dual perspective of the coast from the land and the sea, aimed at highlighting all the relationships that the sea establishes with the coast and vice versa, was made possible with a boat (or kayak in some cases).
●: For further information: https://buonacausa.org/cause/mareliberon-apoli?fbclid=IwAR227hUdGMlSMt_1m31uBy3TqsFGrWpp0EDMFZ8m-L6zy4Que8eRRCYrApHU#.Y5DP4Hrxd-E.facebook.
④: The PUAD, as a regulatory tool, regulates the use of maritime state property areas for tourism and recreational purposes.
●: The network set up multiple online meetings (to conflate observations on the plan), a regional awareness-raising day with information tables and leaflets in each coastal municipality, and a praesidium at the Regional government building. For further information about the initiative: http://www.marelibero.eu/la-campania-reclama-il-diritto-al-mare/.

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18 THE HYDROSOCIAL TERRITORY OF THE BUMBU VALLEY, KINSHASA

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Nowadays African megacities are under constant pressure of hydrogeological risks due to fast paced urbanization combined with climate change effects.

This contribution focuses on the description of the stormwater management system of a sub-watershed of the Congo River nested in the dispersal urbanization of Kinshasa, capital of the Democratic Republic of Congo, within the administrative borders of the Selembao municipality. Despite his central position, the valley is weakly connected to the public utilities and is sustained by hybrid forms of governance, based on the participation of several actors from public and private domain. According to the framework of coproduction, the research tries to deepen the understanding of the hydrosocial territory of the valley, using the stormwater management system as entry point.

18·1 INTRODUCTION

It is a fact that megacities around the world are under a constant pressure of fast paced urbanization, population growth and economic drivers. The academic literature about urban water management agrees on the fact that these pressures are forcing megacities and metropolises to deal with increasing water challenges: water scarcity and water related risks such as flooding or landslides due to the removal of vegetation and run off of rain water (Pavlova, 2020; Davies, 2015; Van den Brandeler et al., 2019). Moreover, further pressures on the already stressed urban water management systems will be added by the effects of climate change, especially in the rapidly expanding African cities, where the urbanization pace is outstanding (Davies, 2015). Even if the literature about Integrated Water Resources Management (IWRM) and sustainable water management in megacities (Integrated Water Urban Management) is a flourishing domain (Pavlova, 2020), a lack of consideration of the river basin scale is still present while addressing urban water management systems (Van den Brandeler et al., 2019).

Recognizing this gap, the paper provides a spatial reading of the stormwater management in Kinshasa, the capital of the DRCongo. Starting from the geo-morphological configuration of the urban territory of Kinshasa, the research aims to deepen the exploration of an individual sub-watershed: the one of Bumbu stream, a tributary of the Congo River nested in the dispersal urbanization of Kinshasa.

18·2 KINSHASA WATER CHALLENGES

The actual form of Kinshasa widely depends from the particular topography of its born site, from colonial-oriented planning, and from the intertwining between these two factors. The scientific literature agrees in individuating the cause of the hydrogeologic risks of Kinshasa in the particular relation between the fragile nature of the soil (Lateef et al., 2010; Van Caillie, 1990) and the negative impacts of urban sprawl on it (Kayembe Wa Kayembe et al., 2016; Lelo Nzusi, 2008). In particular, the unplanned urban extensions over the sandy hills towards the south outskirts of the city, is seen as the main cause of the landslides and flooding affecting the city (Lopanza, 2020). Moreover, numbers show that, due to urban pressure, the capital of DRC will expand his surface of 50%, increasing even more the environmental risks due to an unplanned settlement of his territory (World Bank, 2018) and the increasing of the annual rainfall rate in Kinshasa (Mufwaya and Muchuru, 2016).

This situation of emergency calls for a reflection of the relations between urbanization and water management, but even if from the geoscientific point of view the problematic has already been well described, a spatial analysis of the fragmentation of stormwater management practices is still missing.

In recent past, a consistent support -in terms of economic and technical support- has been provided by the main technical and financial partners (such as, for example: Coopération Technique Belge, Agence Française

Devélopement, World Bank) to the Congolese administration in order to tackle the great challenges of water urban management. The potential effectiveness of this support is however frustrated by the lack of coordination, of interventions' synchronization and a lack of communication between the different stakeholders concerned (AWF, 2015). Thus, the figure of the major intervention at the city scale is still a fragmented one, reflecting the fragmentation of the institutional frame around the delivery of water services (i.e. water supply, stormwater and waste water management). Due to the ineffective framework of institutional actors, the access-to and the management-of water services are ordinarily left in the hands of the very inhabitants of the city, forced to find coping tactics and strategies to respond to water related threats (i.e. flooding, landslides, water shortages, etc.).

An appropriate framework for analyzing the implications of this fragmented figure is given by the concept of 'coproduction': a developing body of knowledge rapidly expanding his application in the scientific literature from the delivery of social services to granting provision of urban services such water, waste and energy (Moretto, Ranzato, 2017; Smith et al., 2021). According to Elinor Ostrom's definition coproduction is "the process through which inputs used to provide a good or service are contributed by individuals who are not 'in' the same organization" (Ostrom, 1996) and it constitutes a flourishing framework in urban studies literature both in Global North and Global South case studies (Mitlin, 2018). In the context of Kinshasa, the conceptualization of coproduction could be a fruitful framework to get over the formal/informal or public/private dichotomies, allowing to deepen the comprehension of the interactions between several stakeholders (communities, privates, NGOs, local institutions, etc.) involved in the management of urban water services and their different scales of intervention.

18·3 LOOKING FOR THE RIGHT SCALE: THE SUB-WATERSHED OF BUMBU RIVER

The geological constraints and challenges for an urban sustainable development in Kinshasa have been explored and documented in recent past, leading to the recognition of three main geomorphologic elements operating in the hydrological local regime: "the Congo River, the tributary streams, and sloping planes. The first two are affected by more than one watershed that has regional scale. The third is governed mainly by local conditions and individual sub watersheds" (Lateef et al., 2010). Starting from this geomorphological scheme, the paper will explore the implications of the "fragmented figure" of urban water management at the scale of the sub-watershed of the Bumbu river. As the cartography shows [fig. 1], it flows in one of the valleys surrounding the plain, were informal settlements set up between independence (1960) and 1990 (D'Ascenzo, 2013). Since then, those valleys constantly suffered from issues that have been exacerbated by densification (Kayembe Wa Kayembe, et al., 2016). For the inhabitants of the valley, water management represents a major challenge under multiple aspects: first of all, due to the lack of an appropriate drainage system

for stormwater causing landslides and flooding in this area during the rain season, secondly because of the shortages of potable water during the dry one (Mutombo, 2014).

In the next paragraphs, the paper exposes the collect of on-field qualitative data, during a three months exploration, in order to individuate, spatialize and contextualize the strategies implemented on an ordinary basis in order to face the management and control of stormwater. The description will move through the recognition of three different kind of infrastructural entities regulating stormwater management at different scales and involving different stakeholders:

1. the physical infrastructure
2. self-help
3. the social infrastructure

18 · 3 · 1 The physical infrastructure

The material infrastructure of the urban draining system in the hilly area of the city, and in particular in the valley of Bumbu river, is the residual system of open-air canalizations built in the late 80s (Kayembe Wa Kayembe, 2020). The system responds to a clear logic: drain as fast as possible the rain water from the top of the hills to the bottom of the valley, preserving the rich neighborhoods and the main ridge roads from the high risks of landslide due to the fragile nature of the soil. At this scale, the Bumbu river, as the other tributaries, is conceived as the natural outflow of the entire system: the "exutoire" of the various stormwater collectors draining the ridge and crossing the slopes without serving them (Mutombo, 2014). This logic well reflects the segregation dynamics driving the settlement on the south-extension of Kinshasa: the drained areas are coincident with the high standing neighborhoods built between 1968 and 1975 (Kayembe Wa Kayembe, 2020), without paying attention to the poorest plots spontaneously settled on the sandy slopes between road and river (Kayembe Wa Kayembe et al., 2016).

The collector is the main public infrastructure serving the urban draining machine and materializing its selective logics of intervention [fig. 2]. It serves the uphill draining network, but once crossing the slope its capillarity is suddenly reduced to zero and its only objective is to reach the valley floor as soon as possible. However, the observation of its functioning during the rainy events showed that its capillarity is perpetually implemented by the inhabitants of the slopes: the collector has become a living infrastructure, capable of attract some sort of habiting practices dealing with its presence.

Through the slope, the ramification of the collector is implemented by the individual initiatives of the inhabitants trying to get the chance to be served from this infrastructure: secondary drainage systems and dikes redirecting overflows are enlarging the area served by the collectors in the valley. But the cohabitation with such unstable territorial device demands also some ordinary maintenance implementations: in fact, during some special intense events, the collector is subject to overflowing, strongly menacing its own integrity and the integrity of the neighboring plots. In a constant instability situation, the ordinary functioning of this device is

taken over by the inhabitants themselves: this dynamic of substitution of public maintenance service by the inhabitants living in its proximity, is in a way blurring the boundaries between public and private intervention on public space and infrastructure.

18·3·2 Self-help

From a top-down point of view we can then read the elements of this machine (open air canalizations, collectors, river), but a zoom into this wide mesh is necessary to individuate the ordinary strategies of people living the slope trying to densify its capillarity. We'll delve into the recognition of the smallest unit of water management in the territory of the valley: the familiar plot.

Different strategies are ordinarily implemented by the inhabitants of the valley to respond to water related issues at the parcel scale such as recycling, retain and infiltrate. These strategies are not homogeneously spread on the territory: the position of the plot in relation with the slope and the main draining system usually define their application. But, rather than follow hydrological oriented rationales, recycling, retaining and infiltrate practices are deployed in accordance with the perception of water related risks such as flooding and landslides. A gradient is then observable descending the slope [fig. 3]: if in the neighborhoods on top rain water is mostly evacuated as fast as possible, the plots on the slope (exposed to water related risks) are mostly equipped with storage, retention and infiltration elements transforming the menacing rain water into a useful resource due to the scarcity of water supply in the area.

If the need for retaining and infiltrating water is evidently encouraged by the perception of erosion and landslides risks, the storage practice is implemented autonomously by each plot in response to another menace afflicting the municipality of Selembao: the lack or shortages of the potable water supply. This strategy is employed with different degrees of efficiency: from the use of small buckets filled with rooftop rain water until the construction of reservoirs (from 10 to 30 cube meters) able to satisfy the potable water need of a family or of a small community during the rainy season. The effectiveness of these strategies, especially retention and infiltration, is nevertheless to be verified. In fact, from the on-field research, numerous conflicts emerge between neighbors due to the spill over of one plot onto another: dimensioning, efficiency and sustainability of these devices might be worthwhile a more specific hydrologic study.

18·3·3 The social infrastructure

To inhabit the valley of Bumbu river means to live in constant tension between the ridge road (the main connection with the city markets) and the bottom of the valley dominated by the river Bumbu and by agriculture (where the proximity to sources and surface water grants an access to this resource). The roads cutting the slope perpendicularly are the crystallization of this tension: the public space connecting these two layers. However, during rain events, due to the lack of water management devices, these linking roads collecting the spill overs of the neighboring plots are transformed in veritable drainage devices, continuously eroding the sandy soil and causing landslides. The cartography [fig.4] shows quite clearly the

relation between these elements and the erosions phenomena: these roads are incrementing the distance between the bottom of the valley with the ridge-roads, rather than connecting them.

But, even if landslide hazard and its repercussions on the flooding events in the valley floor are well known, as seen in the previous paragraphs, the public intervention is limited to landslides events menacing a main road on the ridge or a high standing neighborhood (see a. The physical infrastructure). This lack of public interventions, left a voiding space in urban water governance, letting emerge some collective practices of protection, preservation and maintenance. The "comité de developpement" and "comité de lutte" are new groups of urban dwellers emerging as structural entities in the social territory of the valley. Their goal is to take in charge the maintenance and management of public spaces, especially the sandy and steep roads through which the erosion risk is more relevant. The observed practices include the sharing of the expenses for the attenuation of the erosion heads or the direct implementation of safeguarding interventions, such as the limitation of the traffic on some roads in order to prevent any eroding event that could endanger the community. A peculiar experience has been observed in the locality of "Panu Panu", in the municipality of Badiadingi (Selembao): here, a group of residents decided to renounce to a portion of their private plot in order to enlarge the street and enable a better stormwater management.

Instead then depict the roads as a mirror of an irresponsible urban settlement in respect of topography, we can then portray them as the fertile ground where new forms of governance are taking shape thanks to the recognition of shared needs and threats: the fundament for the emerging of new forms of urban commons.

18·4 A NEW URBAN WATERSCAPE

The observations briefly exposed in the previous paragraphs, using the drainage water service as entrance point, try to materialize a constant tension between public action and off-grid intervention in the river basin of Bumbu river. Due to the variety of actor involved and the complex spatial patterns of water management, the notion of coproduction (Ostrom, 1996) seems to become more and more relevant in the matter of water drainage system, as well as in the access to potable water supply (Bédécarrats, 2019). For instance, the emergence of spontaneous groups for the preservation and maintenance of roads reveals the emergence of "a consciousness of self-worth among these residents who become aware of their own central contribution to progressive social change" (Mitlin, 2008). In the failure state context that Congolese urban worlds represent (Trefon, 2008; De Boeck, Baloji, 2016), more and more attention have to be given to the way the access to basic services is granted or improved by individual or communitarian interventions off-grid: the observation gathered in this paper have to be completed and compared with the other water systems related to it, potable water supply for instance.

The brief description of the three configurations of territorial management (the physical infrastructure, self-help, the social infrastructure), tries to let emerge the spatiality of water management practices in Kinshasa through three different scale of intervention: stressing the importance of the morphological scale of the watershed in the urban context, it constitute a first step towards the recognition of the operational patterns of new forms of governance around the water manage system. As the three categories suggest, these forms reflect the variety of social implications in the matter of territorial organization. Referring to the definition of "hydro-social territory", the paper proposes to look at the urbanization of water as a gaze for revealing "how socio-natural arrangements and water politics either enhance or challenge the unequal distribution of resources and decision-making power in water governance: the mechanisms, structures, knowledge systems and discourses underpinning their operation" (Boelens et al., 2016). In doing so, the description of this territory trough the study of water management spatial patterns could be operated as a lever for revealing urban dynamics embedded in the tight relation between the urbanization of Kinshasa and its specific topography.

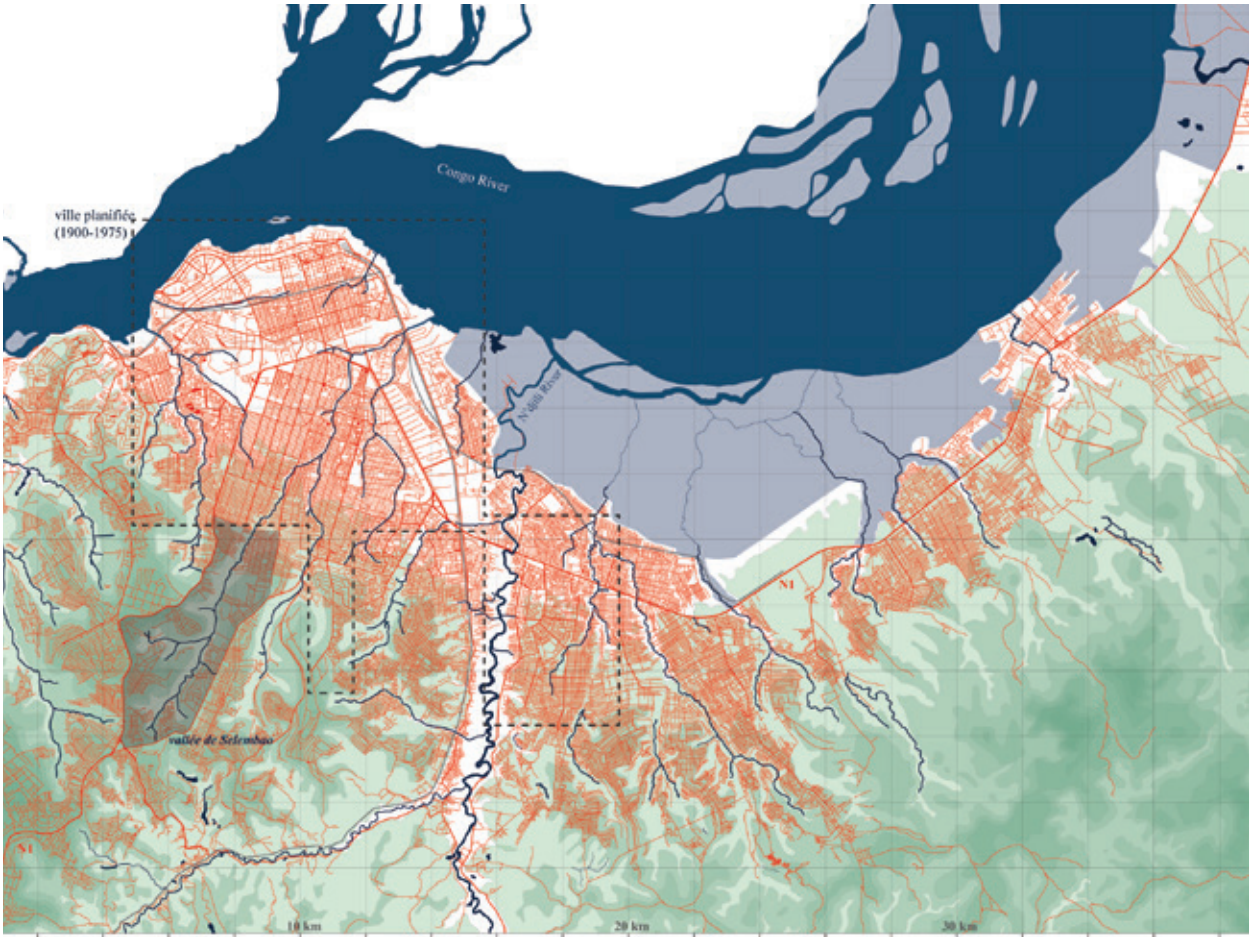
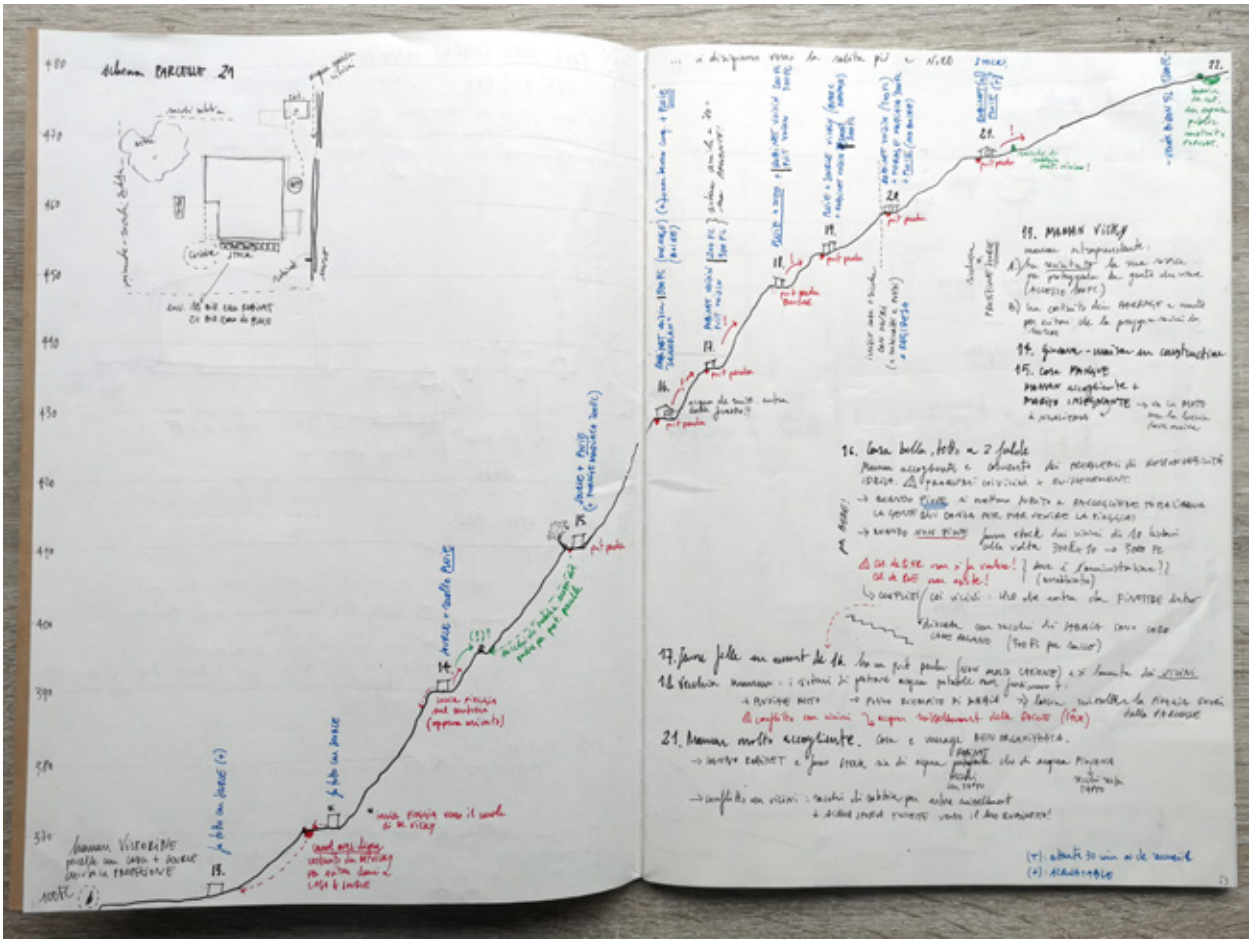


fig. 1. Road pattern of Kinshasa in relation to terrain relief and the main hydrographic network, with the Selembao municipality shaded (map by Eneko Abriesqueta, Iris Ramas, Luana Rivière and Géry Leloutre; Faculty of Architecture, ULB—optional course ADP—2015–2016; graphic layout by the author).

fig. 2. The collector draining stormwater to the Bumbu river. Photo by the author.



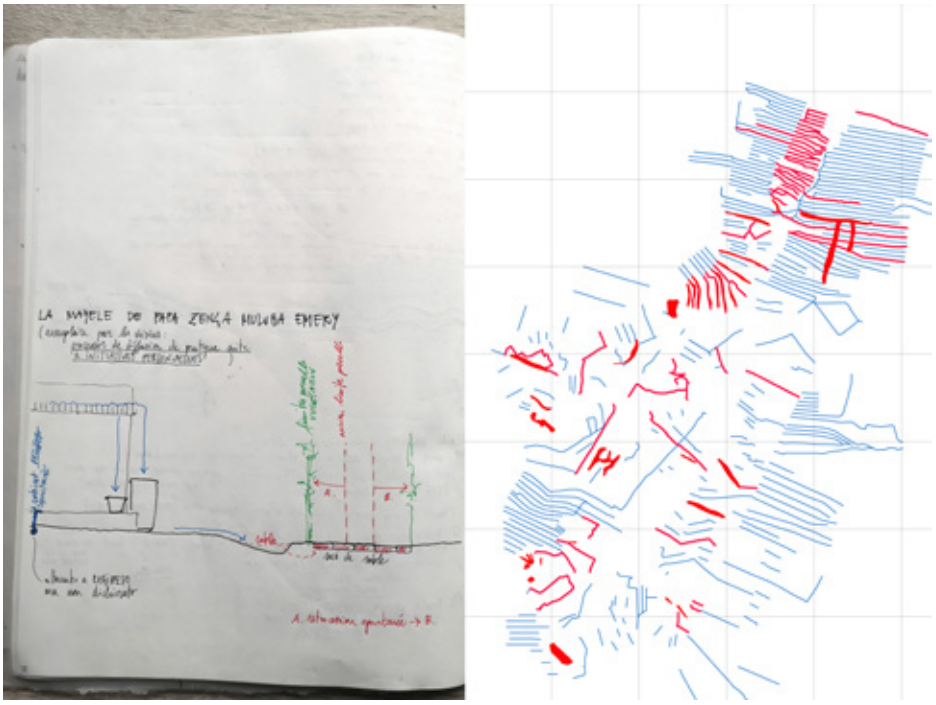


fig. 3. The slope and the coping strategies for facing water insecurity. Sketch taken from the field notebook, drawn by the author.

fig. 4. On the right, the roads (blue) and the landslides (red). Road as a barrier. On the left, reducing private space for common good. Road as fertile ground for urban commons.

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19 BRUSSELS IS LEAKING. MAPPING SPATIAL AND SOCIO-TECHNICAL TRANSITION OF URBAN DRAINAGE SERVICES CONDUCTED BY THEIR USERS

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Throughout time, watercourses are manipulated in response to growing societal needs.

With this transformation, wastewater and stormwater drainage services are put under pressure, raising the urgency for responses to environmental challenges such as flooding, drought, and pollution. Although institutionalized systems are pushing the hand of these changes, water sensitivity is increasingly perceptible in movements in which alternative actors participate. In this research, a historical tracing of hidden layers of the urban area reveals the role of alternative drainage systems. A better understanding of their appearance, disappearance, or persistence through time is explored to tackle the current challenges urban drainage systems face. These changes are framed within the transition theory, focused on the asset of place-specificity. The analyses are conducted in Brussels and accordingly seek to better understand how and at what scale the built environment influences these changes. They aim to spatialize transition studies using mapping and site description.

19·1 SUPPRESSED URBAN DRAINAGE SYSTEMS AND TRENDS OF TRANSFORMATION

Over time, the landscape of industrialized cities has been shaped by its ever-renewing infrastructures to facilitate the daily lives of its inhabitants. Dealing with population growth, rapid urbanization, and climate change, this continuous transformation has put pressure on watercourses situated in and around these urban areas (Koop, Van Leeuwen, 2016). Superficial watercourses have disappeared from the landscape as they were transformed into big underground infrastructures (Dobre, 2020). Flooding and drought events occur more frequently and severely (Koop, Van Leeuwen, 2016) and aggressive paving trends have resulted in a significant loss of infiltration possibilities (Fletcher, Andrieu, 2013). As a result of the foregoing, water pollution, poor health and decrease of biodiversity have become more ambiguous. They ask for resilient solutions (Dobre, Vinke-de Kruijf, 2018). The increase of flooding events in the past years (i.e., in July 2021 in the south of Belgium) triggered many ongoing studies to gain speed. Outcome starts to be visible both in scientific literature and in urban planning strategies (Januszkiewicz, Golebieski, 2019).

Over the past decade, two trends of transformation in urban water drainage management can be observed: the emergence of alternative actions and the attention to an integrative approach. Alternative actions can be understood as actions that go beyond constructing conventional drainage systems, such as the incremental renovation of water infrastructures through neighborhood revitalization projects. Generally, these strategies are applied through local and site-specific interventions, such as permeable pavement design. They draw attention to the ecological conditions and physical setting of the urban areas (Dobre, Vinke-de Kruijf, 2018). In practice, this is usually reflected in technical urban planning tools that incorporate water retention infrastructure into urban development, such as stormwater ponds, ditches, canals, various infiltration facilities, and green roofs (De Graaf, Van der Brugge, 2010). Next to the recognition and use of different water sources and the emergence of alternative infrastructures at different scales, water management benefits from integrative operations ①. Water management services acknowledge the importance of including various actors in service production (Yu, Farrelly, 2011). The relevance of the role of the citizen as an active participant in this production is widely recognized by academics, although this was not always the case in the past (Brandsen, Steen, 2018).

The integrative approach enjoys accreditation since the discovery that decentralized service provision increased opportunities to interact with municipal policy because of decentralized service delivery. It resulted in expanded neighborhood safety and resilience to environmental challenges (Benjamin, Brudney, 2018; Ostrom, 1973). Through time, water management strategies thus changed from a technocratic to a ‘soft’ and participatory perspective as it became clear that the former resulted in poor flexible solutions with high maintenance costs (Mahaut, 2009; Dobre, Vinke-de Kruijf, 2018). Nevertheless, the impact of these trends of transformation on the sustainability of urban drainage systems is still to be understood. However, according to prior research, some alternative actions have proven to result

in more sustainable solutions. Moreover, the integration of civil society in production of services has the potential to support sustainable service production (Dotti, 2016; De Graaf, Van der Brugge, 2010; Faldi, Rosati, 2021). As literature acknowledges, the spatial context in which urban drainage services are embedded has a significant role in service production (Ranzato, Moretto, 2018). The influence of this spatial context on a transforming integrative service production is still unclear. This research aims to contribute to a better understanding of how and why these changes occurred in stormwater and wastewater management. Insights from historical examples on how the built environment interacts with changes in drainage systems are useful to conceive resilient future scenarios.

19·2 POSITIONING THE OBSERVATION OF BRUSSELS' URBAN DRAINAGE SYSTEM TRANSFORMATION

Low-lying areas in Brussels are impacted by the failure of the combined sewerage infrastructure leading to emerging environmental tensions. In addition, the densifying city faces pollution of open waterflows during increasingly frequent and heavy rainfall (Dobre, Vinke-de Kruijf, 2018). A well-known example of emerging solutions from urban studies on water management in Brussels is the experimentation with infiltration zones in streets and private gardens. This service is initiated by various alternative actors (urban designers, citizens, NGOs, municipalities, and researchers) (Dobre, 2020). Socio-technical transition studies investigate these large transformations in service production. Hence, to understand changes in the urban drainage system of Brussels, their relationship with the territorial context is to be unraveled (Geels, Schot, 2007; Köhler, Geels, 2019; Yu, Farrelly, 2011). The European Union is proven to have a lack of academic studies on the spatiality of sustainability transitions (Coenen, Benneworth, 2012; Markard, Raven, 2012). As a result, gaining insights into characteristics of the context and scale of places in transition remains difficult (Gimenez-Maranges, Breuste, 2020). This issue will as follows be addressed from a spatial point of view.

Yet, since the study of large societal transitions lacks a general understanding of how scale and geography play a role, it is useful to look for various examples through space and time (Köhler, Geels, 2019). A preliminary selection of examples will be addressed in the following paragraph. This choice is based on the argument that the integration of the socio-ecological and geographical dimensions of change still requires further development (Raven, Schot, 2012). By doing so, with respect to the place-specific nature of water drainage solutions, one can offer insights into reasons why citizens may or may not change their role in water management. This role is often appearing on a 'niche' level in transition literature and proves significant in place-based sustainable actions. The aim is to gain an understanding of how physical contexts affect the changes before looking at the spatial changes affected by the integrative drainage system. Therefore, four cases in which citizens participate in water management are looked for in Brussels' history. Doing so, a focus is placed on their scale, socio-ecological situation, and hydromorphological context. Hereby, the objective is to

elaborate on the following questions: is the built environment the cause or consequence of the changes in the urban drainage system? Does it impact the role of the citizens in managing stormwater and wastewater? How, and at what scale? This text aims as such to contribute to an exploration of transition processes in urban drainage management at different scales – with respect to place-specificity (Gimenez-Maranges, Breuste, 2020; Hansen, Coenen, 2014).

19·3 BRUSSELS' BUILT ENVIRONMENT INFLUENCING WATER SYSTEMS AT DIFFERENT SCALES

During various periods in the history of Brussels-Capital Region, transformations of the built environment defined the way wastewater and stormwater were drained. For example, the work of Burniat (2012) describes that – from the 15th century onwards – the direction in which the ridge of the pitched roofs was placed on the dwellings affected the way the water was evacuated. This change – directed by the city government through urban regulations – was taken merely to prevent the spread of fire – through the implementation of common walls – and increase the number of dwellings. Yet, it countered stormwater from seeping in between two dwellings and hereby completely changed the streetscape. Streets now served in a direct physical link to the roof as a water drainage way and replaced the former water passages (Burniat, 2012). This reinforces the perception of the street as a drainage route for stormwater. In this case, spatial changes are causing the transformation of the urban drainage system. This results in the increase of visibility of water drainage in the streetscape – hence for the citizens. The impact on the role of citizens is not defined in this example. A second example can be found in Brussels' *impasses* ● that were situated in the low-lying areas around the Senne river in between the old city walls. Most of these streets have disappeared over time, as described by Gaiardo (2008).

Up until the 19th century, the dead-end character of the *impasses* caused major health problems in the parts of the city with highest poverty rates. Both for practical reasons and because of ambiguity about the private or public status of the streets, a connection to the centralized sewer system was hampered. The waste discharge on the streets was not enforced despite the implementation of a prohibitive ordinance. Considering the *impasses* being created on private initiative but connected to public streets, they were semi-public until the government forced them to become public in 1844 (Gaiardo, 2008). When public urinals were abolished at the end of the 19th century because of odor nuisance, a new solution had to be found. It was not until the 20th century that all inhabitants of Brussels had access to running water. An ordinance in 1936 stated that every home had to be equipped with a flushing sink. In practice, this was unaffordable for many. Residents of these impasses – sometimes up to more than 70 households – were assigned to themselves for getting rid of wastewater (Ducpetiaux, 1844). This was accomplished by the construction of a central ditch and the pavement of the ground to facilitate drainage. In this case, the spatial characteristics of the streets delay – and sometimes even prevent – the change

from open drains to a central underground network. In doing so, other practices such as the optimization of the open drainage ditches were reinforced (Billen, Decroly, 2003). Thus, the impact is twofold. Citizens living in the same *impasse* are forced to find solutions themselves while the physical context of the drainage system is also adapted through time. A third example, linked to the densification trend in both previously mentioned examples, is situated in the built-up areas on the flanks of the Senne catchment outside the old city walls.

Due to the pavement on top of the sandy soil in the higher parts of the city in the late 19th century, the flooding problem increased in the lower parts of the river basin. This type of urban morphology is characterized by *Maisons Bruxelloises* – positioned along a rectangular street pattern whereby the gardens touch each other in the middle. These *Maisons Bruxelloises* – studied by Burniat (2012) – were constructed from the second part of the 19th century until the early 20th century. Until the end of the 19th century, they were built without an architect according to a typographical plan. Neighborhoods characterized by a significantly strong topography start to face pressure from stormwater from the roof surfaces on the underground drainage system, augmented by the large amount of runoff water from the streets. These problems, as already described in the first paragraph, have been addressed in two ways throughout the history of Brussels. First, large underground infrastructures were built to temporarily store water (Dobre, 2020). Later, as these structures have proven to be inadequate and inflexible, citizens were forced to find their own solutions (Brusseau, n.d.).

Systems using 'soft' and integrative water solutions are tested. The *Maisons Bruxelloises* are interesting in this regard for two reasons. Some of them already contain a built-in rainwater tank, which can only be investigated and reactivated by citizens themselves. The 'island' morphology in which these dwellings are appropriately located also lends itself to water storage and infiltration in the adjacent green courtyards (Burniat, 2012). This is done at the scale of a housing block or street. In this example, the impact of topography, densification, soil type, and building morphology influenced the water drainage system through time. Citizens living in the low-lying parts of the catchment are forced to come up with water retention solutions while citizens from the upper part can stand in for water infiltration. Until now, the latter has stayed behind in installing retention and infiltration systems for stormwater.

A final example is the infiltration of runoff water in the streets and public places. This intervention is also initiated by flooding precaution in low-lying areas due to impermeable soil. Integrative initiatives are often funded because of their location in lower – less fortunate – parts of the city. The potential of projects in high-lying areas lags. Now, it emerged that the flooding problems and solutions are site-specific, thus limited to the defined (sub-)catchments. Indeed, actions can only be taken where the topography and underlying water networks are beneficial. The soil type needs to be favorable for infiltration to succeed. Public space must be (made) available and citizens must be convinced of the long-term value of the interventions. Attempts have been made to apply techniques learned in specific places to other, but since the actions strongly depend on the residents (socio-ecological and economic potentials) and their environment

(soil, topography, location, and relation to centralized combined sewer system) the diffusion is not always successful. In the above examples [fig.1], changes with respect to the built environment and urban drainage system are observed. Their mutual influence and pressure to transform became evident. Especially soil impermeabilization through built-up area densification and expansion tends to push the relation between the citizen and the water drainage system towards action. We can understand that changes brought to the drainage system occur at different scales for each example: the city, wastewater treatment zone, catchment, urbanized area, river, stream, street, block, community, or individual plot. Their impact on the role of citizens is moreover visible in street, block or 'island', community, and plot. This can be understood when we consider the history and expansion of the city of Brussels, that happened at different stages following different planning strategies. Yet it is remarkable that citizen initiatives are re-emerging where the central system fails. Administrative and geographical scales are hereby overlapping.

19·4 REFLECTIONS AND THOUGHTS ON FURTHER RESEARCH STEPS

The observations that emerged in above-mentioned examples were carried out in different socio-ecological and geographical contexts through space and time. They confirm the hypothesis that the urban area as a configuration of spatial elements in constant transformation influences the operation of a drainage system. The examples show that the city and a drainage system influence each other and can be studied at different, non-conventional scales. However, the examples in this text acknowledge the site-specificity of the changes at the 'niche' level. The water drainage system is examined – without being limited to technical elements – through which it hopes to gain a full understanding of the urban 'water machine'. As these examples are situated in an industrialized city in the global North, big and fast recent transformations are hardly observed. To elaborate changes in the urban drainage system and the built environment, other contexts will be investigated. This research will further develop this understanding through a study on Dakar. Here, the impact of the built environment and the drainage system on the role of citizens will be explored. Preliminary desk research resulted in the selection of some case studies. The aim is to understand how and at what scale the built environment impacts the role of citizens in managing stormwater and wastewater.

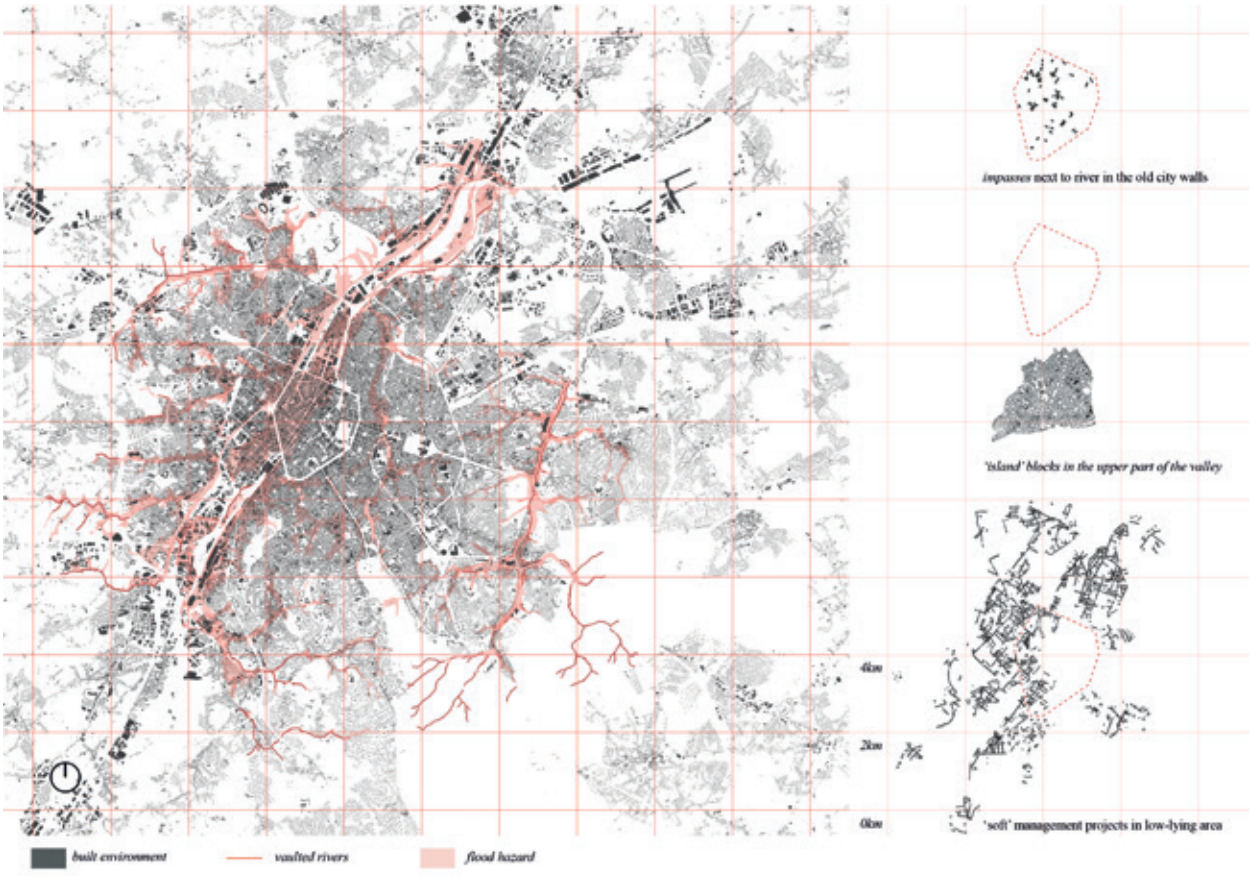

fig. 1. The built environment and the urban drainage system. The place-specificity of three examples in which citizens contribute to the water management in Brussels. Source: elaborated by the author, from Brugis, Geopunt, OSM, Flowbru, and Statbel.

ENDNOTES

①: Integrative operations refer to activities involving multiple stakeholders, often including citizens.
●: A dead-end or *cul-de-sac*. An *impasse* is a narrow road with only one place of access, sometimes leading to an open place.

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IN TRANSITION AT ALL TIMES

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Not a day goes by – in these early Twenties of the 21st century – that we do not wake up with the strange feeling that something has changed.

MISALIGNMENTS

Day by day, the promise of stability and progress – or simply stable progress – seems more cracked, more fragile, held together only by the increasingly discredited guarantees of technological innovation. They make their way with convincing arguments that should make us forget that we have never been modern (Latour, 1993), that we are nevertheless doubly bound to the planet and its temperament. In the face of the evidence, the promises of technology are nothing more than repeated acts of faith to which we have become accustomed (Valerio, 2023) ①.

Yet we wake up to find that we have changed, simultaneously but not in accordance with the changes that have occurred and are occurring in the environment around us. The orderly rhythms of our lives are being disrupted by constant, increasingly intense storms, climate change, and severe weather. What seems to have come back to haunt us, after decades of keeping it at bay with progress and a countervailing sense of dominance over the world and its "things," is a sense of risk. Perhaps the scattering of the planet by cameras and satellites means that disruptive events have a greater echo. They are easier to locate and document, even if they are in remote places. In this planetary view, the disruptive power of the interconnectedness of distant geographies is also apparent, as the pandemic has clearly demonstrated.

Health, environmental, and humanitarian crises outline apocalyptic escalations that challenge most of the certainties on which the West has been built in recent centuries. Above all, the centrality of the human being in the world governance – with all its evidence, from colonialism to scientific taxonomies, from pedagogical models to architecture and cities – is wavering. Paradoxical as it may seem, while calling Anthropocene the current epoch, claiming to be so decisive, humanity is witnessing everyday phenomena that it is unable to predict or control, be it pandemic contagions or extreme weather events. It is precisely the Anthropocene that declares that we are part of a multitude of subjects, even inorganic ones, with whom we share space, time, and the becoming of the world.

Thus, our existence is increasingly invaded by solastalgia, as well as a feeling of powerlessness, reinforced by the recognition of the dense and pervasive interdependencies between our existence and that of other subjectivities (human and non-human) geographically located elsewhere (Schultz, 2023). In a sense, it is the pride of the upright human position that wobbles along with the vanity of fixity of the Western technoscientific

ontology of control. Unpredictability breaks through and the illusory return of the same is interrupted (Coccia, 2023).

TRANSITIONS

In the face of this dismay and collective bargaining, the latest mantra is transition, another of the magic words to be added to the word cloud of 'salvation' (e.g. sustainability, resilience). That is to say, given the state of affairs, the imperative is to change. It is so much evoked, even in very different circumstances, that "transition" vacillates between appearing to be an exorcism and producing semantic satiation.

Transition is a word commonly used in the sense of moving from one state, which one leaves, to another, which one arrives at; this is the meaning of expressions such as "ecological transition" or "energy transition", implying the abandonment of obsolete models in favour of comfortable, effective, and sustainable alternatives. But in such an unstable conjuncture, it is not so much a matter of replacing one model with another as of standing in the change and accepting it as a goal and not just a conduit (Haraway, 2016). Understood in this way, the "transition paradigm" replaces the "solution paradigm" typical of modernity.

Furthermore, transition is rather vague – one can think of many "transitions" – just as it is vague what this change is about, and which subjectivities are involved. Thus, if transition can be adjectivalized in very different ways, what is the qualification of the desired change, the horizon of this movement?

TECHNOLOGICAL

Given the occurrence of side effects of progress, it may sound controversial to acknowledge that the most successful adjectivalization of transition is technological. The basic mechanism of technological transition is to replace the existing socio-technical apparatus with a more efficient and sustainable one. The substitution that this implies is a highly persuasive gesture because it promises an immediate effect without requiring any real change.

Unfortunately – we already have evidence of this – the effects are once again catastrophic and populate the horizon with bad weather. Fixing something by throwing it away, disposing of it, is itself a matter of displacement and externalization: zero change on one side of the wall and increased chaos on the other. Environmental humanists have put it well: substitution produces othering (Armiero, 2021); someone else (human and non-human) receives the waste, is exploited for labour, and is deprived of the material needed to produce "the new".

Above all, substitution is the neoliberal logic that has succeeded in the return of the same and now promises both an anaesthetic against bad weather and a reduction in the frequency of disruptive events: at the push of a button, the same conditions of comfort are guaranteed, disasters are

locked out behind us, regardless of the ever-increasing costs of othering (Hertweck et al., 2023) ●.

ECOLOGICAL

There is a counter-adjectivisation of transition, and it is ecological. By embracing the complex web that connects humans, non-humans and planetary systems (Puig de la Bellacasa, 2017), ecological transition can reverse the reductionist and extractivist perspective of technological transition when and if it distances itself from the certainties of cognitive mastery of the world, which, as mentioned above, are collapsing under the numerous disturbances of the planet.

Ecological transition counters the idea of mastery with the idea of relationality as constitutive of the human-non-human continuum of everyday life. We are part of the life of the planet, despite our upright posture, despite its beauty and its catastrophes, we are fragile in our deep interdependence with other forms of life, including living matter ●.

Even though this understanding of transition is not the most widespread, especially in the organisation of nation-state policies and economic investments, collective practices of ecological reinvention that "turn everyday ecological existence to a terrain of material and political experimentation" are pulsating (Ghelfi and Papadopoulos, 2022, p. 20).

At the same time, ecology can also be insidious, especially when it is used as a tool of conservation (one cannot ignore that ecology and economics have the same origin in the word *oikos*, that is home, and so domain, control, stability, separation). We see this risk every time we consult thematic ecological maps, where homogeneous fields seem to distinguish habitats, and thus to establish the conditions of ecological citizenship, distinguishing between congruent and incongruent species, between those of the place (which therefore belong to a region identified by a reliable and unambiguous edge) and those from outside (stranger ones, when not invasive). Perhaps, it is the time to question the meaningfulness of concepts such as restoration or preservation, which even recur in important documents such as the Nature Restoration Law, approved by the European Union in 2024. Indeed, we should seek for a lexicon capable of expressing the continuous and multi-species making and remaking of the world (co-generation, co-agentivity).

METAMORPHOSIS

Adjectives notwithstanding, according to Pellizzoni (2022), transition implies a change that is more consistent than that implied by revolution or transformation. "Transition conveys the idea of a subtler, smoother, but at the same time more radical morphing. It implies an ontological fluidity unknown to the other types of change. Step by step, the original assemblage is led to become something radically different" (Pellizzoni, 2022, p. 44).

This powerful interpretation of transition seems to echo the concept of metamorphosis, which means "to gradually change, or change someone or something, from one thing to another" (Cambridge Dictionary, 2024). The change is there, and it affects either someone or something.

If we take the biological perspective, metamorphosis has to do with a series of morphological and physiological changes that imply different relationships of the organism with the environment, sometimes provoked by other changes occurring in the same environment. Metamorphosis is therefore mostly reciprocal. Returning to the everyday experience of change mentioned at the beginning of these lines, we should be aware that change does not happen outside of us – or not only – but it is a matter of our own change. It is a slow redefinition – through our own bodies – of our relationship to things and the planet.

Under the effects of the technological syrup, we seem to have forgotten an essential fact, that we too are changing – from day to day, to the point of extinction, that weather and bad weather are not anomalies, but the very life of the planet. From this perspective, what we perceive as disturbing disruptions remind us that we must always be open to change, with a willingness to transition.

In this tangle of bad weather, we can move between forecasts, increasingly intrusive and recursive contingencies, ready to change habits and behaviours. Always seeking to synchronize with the world, with its indomitability and fluidity (Ingold and Simonetti, 2022), seeking metastable conditions (Stengers, 2021), that is, weak equilibria open to subsequent, different equilibria. It is meteorology – with its bad weather – that is not only a privileged vantage point for thinking about living beings (Coccia, 2023), but also a real training ground for standing and imagining in the tangle of the world.

PROJECT

Embracing the unavoidability of transition increases the demand for the project tremendously.

When the return of the same fails, it is necessary to break the dominance of the didactic, repetitive, institutionalising, inattentive, always the same project. This old project does not imagine, it imposes and nominalises. And so, the rule, the guideline, the manual ought to be reorganised and sometimes broken.

The project is challenged as a practice that anticipates, that imagines change and the readiness of existing and future socio-spatial configurations to accommodate it.

The project is challenged insofar as it is a producer of knowledge (Viganò, 2010), insofar as it has the opportunity and the responsibility to make the disposition and exercise of change practicable, not only for those who participate in it, but also for those who will use the space, because use is always a way to interference with the project, it is always a matter of co-design.

It means accepting that the project is a deliberately imprecise vision of the future, interpretable in an authentically performative key. It does not

mean in any way delegitimizing its role; on the contrary, it means claiming the duty of the project, the responsibility of configurative and technical skills, orienting them in a perspective open to authors and actors' expansion. It means thinking of the project as a priming practice that requires wisdom and experience, since working for variable arrangements, with time and its alee, is much more ambitious and complex than to establish fixed and stable conditions.

This idea of project favours experimental production, that possibility of experience that Stengers (referring to Spinoza) calls joy, "an increase in the power to act, and thus also to think and imagine" (Stengers, 2021, p. 151-152). It is, therefore, a project that bends technology, not submits to it, in order to remain open to the vitality of the world.

ENDNOTES

①: “The verb of science is to try, that of technology is to believe [...] To believe is the verb of faith.” (Valerio, 2023, 44-45, translation by the authors)
●:Hertweck et al. (2023) remind us that “after all, the total mechanization and technologization of modern life go hand in hand with a natural (or planned) obsolescence of the technologies used.” Borrowing from David Harvey’s notion of the “spatial fix” – which describes capitalism’s strategy of regulating crises temporarily through geographical and technological expansion – we can understand fixes as processes that do not solve capitalism’s inner contradictions, but merely displace them (Harvey, 2001).
●: “This supposedly inanimate and governable matter has become something unrecognisable whose destructive power puts us in the middle of a multitude of ecological troubles” (Ghelfi and Papadopoulos, 2022, p.14).

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