Ground(s)

Mapping, Designing and Caring: Towards a Convivial Society

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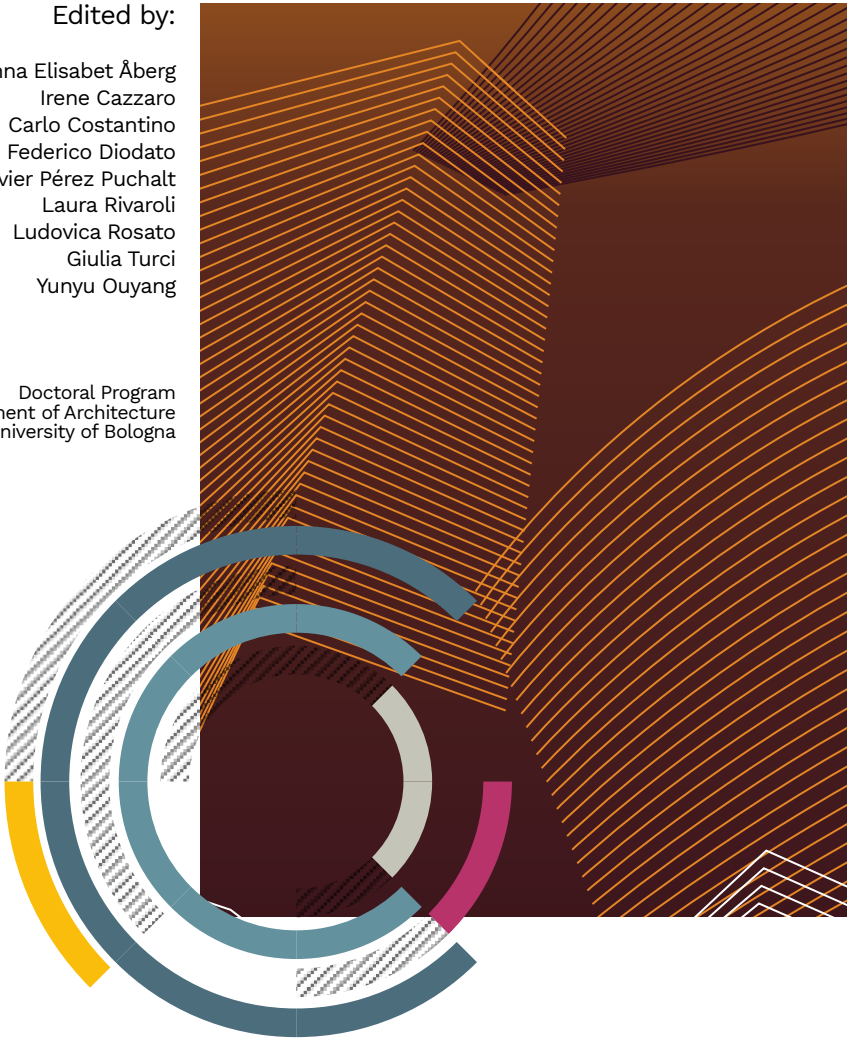

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GROUNDs

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Ground(s): An Interdisciplinary Exploration of Societal Transformation and Spatial Dynamics

Annalisa Trentin
Coordinator – Unibo PhD program in Architecture and Design Cultures

The international conference *Ground(s): Mapping, designing and caring: Towards a convivial society*, held in December 2021 at the Department of Architecture of the University of Bologna, represents an intellectual activity, that transcends traditional academic boundaries.
Emerging from the idea of the candidates of the PhD 35th cycle in Architecture and Design Cultures - Unibo: Hanna Elisabet Åberg, Irene Cazzaro, Carlo Costantino, Federico Diodato, Javier Pérez Puchalt, Laura Rivaroli, Ludovica Rosato, Giulia Turci, and Yunyu Ouyan, this conference is one of the annual appointments, developed by PhD candidates to open a discussion on topics of interdisciplinary nature, useful for expanding knowledge and research goals, carried out within doctoral research and within the Department of Architecture of Unibo. The aim of these conferences is to highlight that contemporary challenges require a fundamentally integrated approach, fundamental paradigms of spatial understanding, moving far beyond conventional

disciplinary constraints, showing a growing understanding that the complex problems of our era, as environmental degradation, social fragmentation, and technological disruption, cannot be addressed through narrow, specialized perspectives.

In this light, the concept of *Ground(s)* emerged as a rich, multidimensional metaphor that simultaneously encompasses physical, social, ecological, and philosophical terrains. It represents more than a mere physical surface; instead, it becomes a dynamic interface where human activities, technological innovations, ecological systems, and cultural practices continuously intersect and negotiate their relationships. This conceptualization challenges traditional notions of space as a static, passive background and instead proposes an active, and responsive understanding of spatial interaction.

This publication thus becomes more than a mere collection of academic papers. It represents the research for a new approach to understanding our environment, that recognizes the profound interconnectedness of human and non-human systems, that embraces complexity and uncertainty, and that proposes creative, adaptive strategies for addressing global challenges.

The contents emerging from this conference suggests that the most innovative solutions will arise not from disciplinary expertise, but from the fertile ground between disciplines, where different ways of knowing and seeing can dialogue, conflict, and ultimately generate new insights.

The University of Bologna's PhD program in Architecture and Design Cultures has always pursued and promoted, while recognizing the identity of the specific disciplines, a model of interdisciplinary education, demonstrating how academic institutions can serve as laboratories for social and intellectual innovation. By creating spaces where architectural composition, urban studies, historical research, aesthetic theory, design practices, cultural heritage studies, and technological innovation can intersect, the program challenges traditional academic boundaries combining fundamentals and applied research in an interdisciplinary perspective. The research activity is therefore developed according to thematic areas that, given the nature of the PhD

program, aim to develop studies in the field of architecture and design cultures as wide as possible. The organization of annual doctoral conferences becomes a training activity for PhD students who collaboratively develop a cultural event that addresses project cultures as comprehensively as possible. The international conference Ground(s) - Mapping, designing and caring: *Towards a convivial society,* which follows those organized in previous years as*: The Matter of Future Heritage; CHANCES. Practices, spaces and buildings in cities' transformation; The Ecological Turn. Design, architecture, and aesthetics beyond "Anthropocene"*, once again focuses on topical matters trying to open a debate on contemporary issues.

The conference's three primary tracks: Mapping, Designing, and Caring, provide a systematic framework for understanding and transforming our relationship with space and environment. Mapping goes beyond traditional cartographic practices, utilizing advanced technologies to reveal complex, often invisible networks of relationship and interaction. Designing transcends mere aesthetic or functional considerations, proposing adaptive, flexible approaches that anticipate future challenges and embrace systemic complexity. Caring introduces a profound ethical dimension, challenging anthropocentric perspectives and advocating for a more symbiotic relationship with our environments.

Particularly significant was the conference's timing, emerging in the aftermath of the global COVID-19 pandemic, a moment that dramatically exposed the vulnerabilities of our existing social and spatial structures. The pandemic revealed the fragility of our interconnected systems while simultaneously highlighting the critical importance of community, adaptability, and resilience. By focusing on the concept of Conviviality, the conference envisioned a transformative reconfiguration of spatial and social dynamic, moving beyond isolation and competition toward more collaborative, supportive modes of coexistence.

Keynote speakers invited by PhD candidates at the Ground(s) conference brought extraordinary depth and diversity to the discussion: Paola Viganò from the École Polytechnique Fédérale de Lausanne

(Switzerland) and Università IUAV di Venezia (Italy), with her cutting-edge research in urban planning, offered insights into territorial design that challenge conventional urban development models; Roberto Scopigno from the Institute of Information Science and Technology "Alessandro Faedo" (ISTI), Italian National Research Council, demonstrated his expertise in digital humanities and how technological innovation can transform our understanding of spatial and cultural landscapes; Beatrice Lampariello from the Université Catholique de Louvain (Belgium) provided critical perspectives on global spatial dynamics through her comparative studies on radical architecture; John Martin from the University of Plymouth (UK) illuminated the intricate relationships between design, culture, and social transformation through his research.

In essence, the *Ground(s)* conference and its resulting publication move beyond established academic discourse. The work presents a provocative invitation to reimagine spatial, environmental, and interpersonal relationships, challenging conventional perspectives by embracing complexity, cultivating systemic empathy, and proposing more responsive, resilient, and collaborative conceptual frameworks for future design.

Ground(s). Mapping, Designing and Caring: Towards a Convivial Society.

Irene Cazzaro, Carlo Costantino, Federico Diodato, Ludovica Rosato, Giulia Turci

The ground represents the tangible substrata that forms the basis upon which life exists. It serves as a crucial source of essential nutrients and constitutes a non-renewable component of our natural capital, fulfilling fundamental human needs: a mere handful of soil contains at least 8 billion living organisms, such as bacteria and earthworms, a number that is analogous to the global human population. These organisms are in a constant state of flux, cohabiting and contributing to the co-evolution of our ecosystems.
Simultaneously, the ground embodies an intangible element, underpinning our sense of belonging and heritage: the substrate upon which human communities take root, flourish, and imprint their legacy. In the context of the urgent need for ecological reorientation of our territories, contemplating the multidimensionality of the ground offers an opportunity to integrate its tangible and intangible dimensions.

This publication traces the dialogue of a conference held at the University of Bologna on 10 December 2021. The conference aimed to transcend disciplinary boundaries, inviting speakers from across fields around the globe and striving not only for convivial discussions but for a convivial environment. As the paper contributions by Francesca Sabatini, Kevin Santus, Marco Manfra and Davide Turrini show, if the moment we are living in is one of multiple crises, it is also the moment to prepare the ground for a renaissance. A renaissance that, if it ever happens, will require a shift in planning practice towards forms of community involvement capable of mobilising local energies, transforming the hierarchy of established values and experimenting with new forms of local development.

The publication attempts to get to the heart of these new forms by analysing three measures:

- Mapping the ground(s) means the act of description: how can we produce knowledge that reveals the relationship between humankind and the environment?

- Designing the ground(s) involves an active response to contemporary challenges: how can we imagine new rules and forms in the long term?

- Caring for the ground(s) encircles the act of prevention: a process of daily maintenance to generate a co-evolving relationship. Is it possible to strengthen (inter)dependency between the human and non-human world?

Through the examination of these pages, let us join in a co-creation process, working from the ground up to re-inhabit our territories in a more equitable way.

Mapping the Ground(s) means the act of description, a process that allows the generation of knowledge to reveal the bond between humanity and the environment. In this section, we analyse various examples of technological tools – such as digital

visualisations and 3D models – used not merely for their photorealistic qualities, but also – and primarily – as heuristic instruments capable of leading to new discoveries.
This becomes particularly apparent when the work is conducted in an interdisciplinary environment, allowing the virtuous integration and processing of various aspects from different disciplines within a model or visualisation.
Two research papers are presented here: “The Val di Sole blueprint: mapping dynamics assets for sustainable development of marginal territories in Alpine context” by Sara Favargiotti, Chiara Chioni and Margherita Pasquali, and “Habitats portraits: trans-scalar mapping as an exploratory tool to unveil the dynamics of inner areas in Marche region” by Maria Giada di Baldassarre, which are all part of the same PRIN project: “Branding4Resilience”. This project deals with the transformations of marginal territories in various Italian regions, adopting a trans-scalar and multidisciplinary approach.
In the first case, the preliminary results of the research unit of the University of Trento are presented. Here, data collection leads to the mapping of the spatial, ecological, and social elements of the territory, especially at a hydrological network level. This becomes an operational tool for co-design processes towards a territorial strategy based on the value of water.
In the second case, the paper illustrates a part of the author’s doctoral research, where trans-scalar mapping allows for the exploration and discovery of territorial dynamics. This especially occurs through the eyes of the planner, who captures the positive and critical aspects through an integrated reading and a holistic approach, leading to the generation of new knowledge.

Starting from the layering process of the city as a description of the complexity of contemporary reflections between humankind, architecture, design, and ecosystem, **Designing the Ground(s)** has gathered research that brings the territory into a systemic perspective. The Ground(s) was perceived as the empty space that, by connecting different elements in relation to each other, forms an organised and global

unity. In this perspective, among the papers selected for the conference, Ground(s) was the tool for the future articulation and qualification of the territory, from small to large scale, a flexible and adaptable element that considers time as its main component. And if imagining new models requires creativity and innovation, it also demands strong political and social will.
Within the featured articles we see how Ground(s) was designed according to different perspectives: as a condenser of knowledge, able to restore the dialectic between unity and fragment, continuity and discontinuity, identity and difference, as a platform able to help define design standards to establish rules with the organisation of public space as the main objective or as a territory extendable in its boundaries and composition to implement new connections.
Two research papers are presented here: “Sailing the Farm. Three Projects about Ground and Its Politics onto Water Surfaces” by Matteo Vianello and “Designing the Accessibility of Ground(s) through Data and Design-Driven Methods” by Margherita Ascari and Virginia Vignali.
In the first paper, the author presents a research focused on how in areas like the Netherlands and coastal U.S. cities, architects are utilising water surfaces for urban development to address land scarcity and complex food supply chains. Water surfaces offer flexible urban land use and local food production. The floating dairy farm in Rotterdam exemplifies this trend, rooted in countercultural and artistic projects since the late 1970s.
In the second paper the concept of Ground(s) encompasses functional, relational, and mediating spaces. This paper explores how to ensure these spaces are accessible and inclusive for sustainable development. Using case studies, it shows how creative and cultural disciplines can design such spaces with an intersectional approach, empowering individuals as drivers of sustainable change, and leveraging digitisation and data for inclusive narratives.

Caring for Ground(s) involves pre-emptive actions: a daily practice of maintenance that fosters a co-evolving relationship. This continuous interaction creates a symbiotic bond where human efforts to care

for the environment are complemented by the ecosystems' ability to provide resources and maintain ecological balance. By emphasising this relationship and recognising the critical role of ecosystems in supporting biodiversity and regulating natural processes, we can strengthen the interdependence between the human and non-human. This enhanced cooperation leads to a more resilient and harmonious coexistence, ensuring the sustainability of both human communities and the natural world they depend upon.
Three key research pieces are presented: "Caring for Infrastructural Grounds: A Research Agenda" by Leonardo Ramondetti, "Four Revisions Toward an Embodied Landscape Architecture Practice" by Alice Lewis, and "The Need to Design the Energy Ground" by Fabrizio D'Angelo.
Ramondetti's research emphasises the importance of caring for infrastructural grounds not just theoretically but through active design. He identifies three key categories of contemporary infrastructural grounds—grounds of storage, grounds of exploitation, and grounds of regulation—examining a representative space for each of them.
Lewis's research explores four landscape architectural concepts to incorporate the generative power of citizen action, emphasising that environmental stewardship should be driven by community involvement rather than solely by landscape architects. The revisions focus on discursive sites, embodied actions, facilitation, and tactical urban opportunities, highlighting the importance of citizens as catalysts for landscape care.
D'Angelo's contribution addresses the relationship between ground and energy, detailing significant spatial transformative trends in energy transition. His study advocates for a new culture of energy spaces aimed at achieving a balanced transition. He highlights compelling examples from Northeast Italy focused on reducing conflicts, disparities, and environmental pressures.

The diversity of topics allowed for an exploration of the numerous and intertwined relationships that develop around the theme of Ground(s). The conference unified three fundamental and interconnected themes - Mapping the Ground(s),

Designing the Ground(s), and Caring for the Ground(s) - as a framework for understanding and reshaping our relationship with the environment. A framework for producing knowledge, imagining sustainable futures, and fostering a symbiotic relationship between humanity and the natural world.

In conclusion, the conference provided us with a clear and articulated vision of how we can interact more consciously and sustainably with our environment. An integrated approach that combines knowledge, creative design, and sustainable practices and enables us all to address contemporary environmental challenges. In this perspective, the combination of mapping, designing, and caring for the Ground(s) offers a comprehensive, interdisciplinary perspective that can guide us towards a more sustainable and interconnected future.

Caring for the Underground: the Human-centered Mapping of Homeless People by the Urban Commons of Bologna.

Urban Commons; Urban Regeneration; Ethics of Care; Activism; Social Innovation

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The paper focuses on how stances of urban commons and active citizenship fill institutional voids in urban governance. Specifically, it analyses how a political collective in Bologna, Làbas, addresses the issue of homeless people with a twofold action: on the one hand, by providing immediate care and assistance to people living on the street, and on the other, by mapping the geography of homelessness in the city.
The first section of the paper builds the theoretical framework for the case, with reference to urban democracy and urban commons, and providing a critical assessment of conventional narratives on wellbeing. The second section focuses initially on the Bologna commons and on Làbas, then moves to describing Staffette Solidali for homeless people illustrating its two dimensions, which cannot be disentangled, of mapping and caring for homelessness in Bologna. Conclusions reflect on how Làbas was able to fill an institutional void; on the need to incorporate ethics of care in public governance and challenge official narratives, and on how the commons

contribute to these political goals.
The paper uses grounded theory to develop case-specific insights and theoretical inferences; primary data and information were collected through participant observation from March to July 2021.

Annus horribilis, annus mirabilis

This year has been of a graceful sort for the city of Bologna: according to the yearly study developed by the financial newspaper Il Sole 24 Ore, Bologna climbed up by the 14th position up on top of the list and was awarded the title of Italy's most livable city[1]: with its rich cultural offer, its clean air and lively business, the Bologna dwellers and its administration have worked hard to make it a rich, creative and livable city. A further milestone was added in 2021: after more than a decade of applications, UNESCO included Bologna's porticoes in the list of World Heritage List[2], acknowledging their uniqueness.
Bologna owns yet another primacy: its public life, rooted in the city's active citizenship, in the intense political commitment of its students (with centennial roots[3]), and in the grassroot movements that have originated from the synergy of Bologna's diverse dwellers. Over the years, the administration proved responsive to these collective stances, and activated a remarkable cooperation between bottom-up and top-down levels. One of its tools is the Neighborhood Labs (Laboratori di Quartiere), where citizens dialogue with agents of the municipality over issues, desires, and future strategies for improving the place they inhabit.
The most pioneering tool was, however, the Bologna Regulation for the Care and Regeneration of the Urban Commons. Published in 2011, it was conceived as 'a new institutional and economic system based on the

1. "Qualità della vita 2020," Il Sole 24 ore, accessed Sept. 7th https://lab24.ilsole24ore.com/qualita-della-vita-2020/
2. "The Porticoes of Bologna," UNESCO, Accessed Sept. 7th https://whc.unesco.org/en/list/1650/.
3. Virgus Ray Cardozier, "Student Power in Medieval Universities," *The Personnel and Guidance Journal*, 46, n. 3 (1968): 944-948.
4. Euro Cities, "The City as a Commons: Regulation on Collaboration between Citizens and the City," *Sharing Cities,* 2015, https://sharingcities.eu/eurocities/documents/The-City-as-a-Commons-Regulation-on-collaboration-between-citizens-and-the-city-WSPO-AXKBGB.

model of 'civic collaboration"[4]. The regulation, a pioneering venture between a public administration and its citizens, has produced more than 280 collaboration pacts as to 2017[5].

Beyond narratives: the invisible citizenship of homeless people

With its now world-renowned heritage, its growing wealth and its municipality's participative tools, Bologna stands as an exemplar city, where collaboration produces wellbeing.
But is wellbeing for all?
The predictable answer to this question is negative: some members of society lack economic significance, because they do not produce wealth; they cannot take part to participative processes because they are legally invisible; they cannot be sampled by big data, because they do not have access to technology. In simple words, homeless people are often not included in efforts towards a better city.
There is no reliable statistical data on homeless people in Italy: the most recent sample dates to 2014 (by the Italian National Institute for Statistics, ISTAT) and it reported that 51.000 lived on the street – most of them being males, half of them being immigrants and living on the streets in Northern Italy[6]. In the study, Bologna is the third city with the greatest number of homeless people (with Milan and Turin taking the first and second position respectively). As Figure 1 shows, numbers have slightly increased from 2011 to 2014. In the past 7 years, and with the contribution of the pandemic crisis, they are likely to have grown even more, while the overall number of services (soup kitchens and dormitories) available in the city has decreased.
Dormitories provide approximately 400 beds, covering less than 40% of the actual number of people in need of a place for the night. In 2015, the Municipality

5. Ivana Pais, Elena de Nictolis and Michela Bolis, "Evaluation of the Pacts of Collaboration Approved through the Regulation for Collaboration between Citizens and the Administration for the Care and Regeneration of the Urban Commons. Empirical Evidences from the Case of Bologna", September, 2017). https://ssrn.com/abstract=3137002. Investigations are needed for the years 2018-2021.
6. ISTAT. "Le persone senza dimora," https://www.istat.it/it/archivio/175984

	2011 Valori assoluti		2014 Valori assoluti	
	Servizi	Persone senza dimora	Servizi	Persone senza dimora
Nord-est	**209**	**9.362**	**185**	**9.149**
Emilia Romagna	101	4.394	87	3.953
Bologna	*24*	*1.005*	*19*	*1.032*

Fig. 01
The number of homeless people in Bologna and of the services (soup kitchens and dormitories) available in the city. Credits: ISTAT 2014.

activated the 'Piano Freddo', which provides 200 additional beds in the months from December to March – meaning that these beds are not available during the rest of the year. This number has never been stabilized, and the Municipality continues to consider this operation an 'emergency measure' rather than a structural provision for a structural issue[7].

Since their political power and their economic weight is null, financial newspapers and local administrations do not account for them. For the former, they are not part of a productive process –social Darwinism is still subtended to neoliberal narratives: their analysis, therefore, leaves out those citizens whose income is not measurable – because they do not have one; whose rent cannot be annotated – because they do not have a house; whose per capita spending on culture is not accounted for – because they cannot spend.

For the latter, they are not needed to build consensus. The local administration, which is supposed to engage citizens in the production of a better city, fails to involve in this dialogue a category of urban dwellers whose lives are in utter need of an improvment. The risk of 'empowering the empowered', i.e., to involve only the active, well-off citizens, had already been highlighted at the beginning of participative urban democracy – in his seminal text, Fung noted how "voices of minority, less educated, diffident, or culturally subordinate participants are often drowned out by those who are wealthy, confident, accustomed to management, or otherwise privileged"[8].

Can cities really be just and inclusive without caring for the outcasts? In a city which is increasingly being

7. "Interventi di emergenza," Rete Civica Iperbole, accessed Sept. 9th, 2021, http://www.comune.bologna.it/sportellosociale/servizi/2708/58993/.
8. Archon Fung, *Empowered Participation: Reinventing Urban Democracy*, (Princeton: Princeton University Press, 2004), 20.

datafied, and in which participation resembles an educated tool for building consensus, rather than for fighting inequality, it is urgently necessary to recover an ethics of care in public governance – especially at the urban level, which is better able to identify and address the needs of those at the margins.
This matter is the more stringent for a city like Bologna, if it wants to perpetuate its claims to look at the city as a commons.

Bologna and the commons: a controversial history

'Commons' is the term used by the Municipality to connote urban assets in its 2011 Regulation. The expression is borrowed from institutional theory and political economy, and refers to natural or man-made resources which are owned, or managed, in common. The term regained popularity with Nobel Prize Elinor Ostrom's research (1990), which analyzed natural common-pool resource systems in different parts of the world to illustrate that there was a possible 'third way' between privatization/market action and government intervention in managing resources and caring for one's ecosystem.
Ever since her work, the commons terminology has expanded to a variety of other domains, namely the urban one. Urban commons theory has evolved in two main directions: on the one hand, urban commons have come to coincide with oppositional stances, claims for the 'right to the city[9]' and acts of resistance against neoliberal governmentalities[10]. On the other hand, administrations and governance bodies have appropriated the term to describe participative tools and horizontal forms of governance; in parallel, a branch of the academic discourse is beginning to consider top-down and bottom-up hybrid partnerships as commons-like[11].

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9. David Harvey, "The Right to the City". *New Left Review 53* (2008): 23-40.
10. Christian Borch and Martin Kornberger, *Urban Commons: Rethinking the City* (London, Routledge, 2015).
11. Among others, Andrea Boeri, Danila Longo, Martina Massari, Rossella Roversi and Francesca Sabatini, "Commoning in the Practice of Urban Governance: An Experience from OBRAS Project". *Agathon 8* (2021): 184. Leïla Kebir and Frederic Wallet. *Les communs à l'épreuve du projet urbain et de l'initiative citoyenne* (Paris: Plan Urbanisme Construction Architecture, 2021).

Bologna is familiar with both sides of the commons: the Regulation has allowed the administration to transform commoning into a governmental tool for collaborating with local community – or, if one is to contest the definition, as a way of reframing grassroot political action into institutionalized control. In fact, Bianchi[12] and Leitheiser[13] emphasize this downside of governmental appropriation of the commons: the former, analyzing precisely the Bologna regulation, points out how is has de-politicized the term, thus depriving it of its political strength in favor of consensus. The latter, looking at a German example of food commons, observed that the presence of governmental authorities caused citizens to take the role of spectators, rather than active commoners.

At the same time, non-institutionalized urban commons have a strong presence in Bologna: since the 1990s, several abandoned spaces have been occupied and claimed back for the city - it is remarkable that Bologna is the only city in Italy with less than a million inhabitants to have had 20 active social centers between 1995 and 2003[14]. While the Municipality allocated spaces to compliant and educated citizens through the Regulation, it violently repressed and evicted many of these urban commons: Atlantide (2015), XM24 (2019) and Làbas (2017), the focus of the present study.

Born in 2012 from the occupation of former Masini barracks, Làbas represented an essential collective resource for the city, offering, among other services, a free space for people to meet, for immigrants to learn Italian, and for local farmers to sell their products; its enclosure led to an impressive mobilization of thousands of people, which forced the administration to negotiate and eventually reopen it.

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12. Iolanda Bianchi, "The Post-political Meaning of the Concept of Commons: The Regulation of the Urban Commons in Bologna," *Space and Polity,* 22.3 (2018): 287-306.
13. Stephen Leitheiser, Elen-Maarja Trell, Ina Horlings and Alex Franklin, "Toward the Commoning of Governance," *Environment and Planning C: Politics and Space* (2021): 13.
14. Pierpaolo Mudu, "Resisting and Challenging Neoliberalism: The Development of Italian Social Centers," *Antipode* 36.5 (2004): 929.
15. Lucia Artner and Wolfgang Schröer, "Care, Commons, Citizenship—How Social Work is Affected," Transnational Social Review, 3.2 (2013): 143.
16. Kirstein Rummery and Michael Fine, "Care: A Critical Review of Theory, Policy and Practice," *Social Policy & Administration* 46.3 (2012): 323.

Care and the commons

Urban commons, therefore, are not only a collective civic endeavor of crucial importance: they sometimes fill the voids of the institutions by providing absent services or answering neglected needs. As such, they represent, according to Artner and Schröer[15], one of the three pillars of 'social work' – which, in their 3Cs model, are commons, care, and citizenship, where care can be intended as 'empathy and the recognition that the condition of another is important and that this involves both an interest in their life and a degree of responsibility for their well-being is fundamental to what we consider to be care'[16]. Born as a political concept and a claim within feminist critique (as 'care' has for long been an undervalued and/or underpaid activity undertaken by women in societies[17]), care has been seen as a concept embedding political economy: specifically, it has to do with a paradigm not just of production, the imperative of the capitalist regime, but of reproduction[18], of 'maintaining, continuing and repairing the world'[19] – with applications to both the human and the natural, thus imbuing notions of social justice and sustainable development in the welfare state[20]. At the wake of globalization, as most of social work has been undertaken in the Global North by migrants from the Global South, new global imbalances subtended to the context of care, with implications in economic geography as well as political economy and feminist critique. Làbas, as an urban commons, enacted a model where care, commons and citizenship were intertwined[21] by addressing an issue which was

17. Grace Clement. *Care, Autonomy, and Justice: Feminism and the Ethic of Care* (Routledge, 2018).
18. Johannes Euler, "Conceptualizing the Commons: Moving beyond the Goods-based Definition by Introducing the Social Practices of Commoning as Vital Determinant," *Ecological Economics*, 143 (2018): 13.
19. Joan C. Tronto, *Moral Boundaries: A Political Argument for an Ethic of Care* (New York: Routledge, 1993).
20. Lothar Böhnisch and Wolfgang Schröer. *Social Work. A Problem-oriented Introduction* (Walter Gruyter GMBH & Co Kg, Berlin, 2016).
21. Joan C. Tronto, *Caring democracy: Markets, equality, and justice* (New York, NYU Press, 2013).

otherwise neglected by the public administration: that of homeless people.

A human-centered mapping of homeless people: the experience of Staffette Solidali

Method and ethics

Empirical information was gathered through a 5-months period of ethnographic research, and particularly of participant observation, defined as "the process enabling researchers to learn about the activities of the people under study in the natural setting through observing and participating in those activities"[22]. The concept of 'people under study in the natural setting' ought to be modified for the purposes of the present research, as a situation of horizontality occurred in which I did not position myself as an external or superior presence, but as an activist and volunteer; this "duality of the researcher's role as critic and participant"[23] is a driver of biases, but also alleviates ethical concerns.

The empirical methodology was not just used for descriptive purposes, but to advance research on commons theory[24] and urban governance, thus positing itself in the framework of grounded theory, where research situations generate new theoretical knowledge, in this case about urban commons, collaborative governance, care ethics.

Action and reflection in Staffette Solidali

In March 2020, as the pandemic was ravaging Italian cities, two of the most important urban commons of Bologna, TPO and Làbas, and the 'Ya Basta' association, gathered food and

22. Barbara B. Kawulich "Participant Observation as a Data Collection Method," *Forum qualitative sozialforschung / Forum: Qualitative social research* 6.2 (2005): 2.
23. Kirsten Bell, "The 'Problem' of Undesigned Relationality: Ethnographic Fieldwork, Dual Roles and Research Ethics," *Ethnography* 20.1 (2019): 4.
24. Barney G. Glaser and Anselm L. Strauss, *Discovery of Grounded Theory: Strategies for Qualitative research* (London, Routledge, 2017).
25. Sarah Gainsforth, "Le reti solidali riempiono il vuoto lasciato dallo Stato in Italia", *Internazionale*, March 29th, 2021 https://www.internazionale.it/reportage/sarah-gainsforth/2021/03/29/reti-solidali-bologna-vuoto-stato

medicines, collected thousands of euros through crowdfunding, and began their *Staffette partigiane solidali*, 'Caring partisan dispatches'[25], later Staffette Solidali (Staffette hereon). In the same period, *Laboratorio di Salute Popolare* (Popular Healthcare Lab) was born, in correlation with *Staffette Solidali,* with the aim of providing medical care for those who do not have access to the Italian National Healthcare System for various reasons (because they do not have a domicile, or are immigrants without a regular permit of stay, or both).

The city has been divided into areas that are covered by groups of Staffette, ranging from four to six members – one of them is a volunteer from the Popular Healthcare Lab. The groups, meeting in and leaving from Làbas, tour the city with their bikes and riders' backpacks filled with packed food and hot tea. If needed, medical assistance is provided, but emphasis is not placed on healthcare as much as on *care* in a broader sense: stories are listened to, small talks are made, and tea is shared as the volunteers spend time with the homeless.

At the end of each tour, all volunteers head back to Làbas and gather. The meetings have a threefold objective: the first is informative, as all the group members share information about the current situation in the different areas to update the others about the conditions of the homeless, or about new people found on the street. The second is decisional: as part of a commons, the community of volunteers negotiates and discusses the modalities of the project, propose modifications and adjustments. The third is self-reflexive, as people share the difficulties they have encountered during the tour, their feelings and personal thoughts.

Other meetings occur during the year to train the volunteers which focuses on two dimensions: the first, carried by peer-volunteers (some of whom with a training in psychology), relates to the behavioral and psychological dimension, as volunteers are taught about how the tour is done, how to approach delicate situations, how to address questions in a friendly way. The

Fig. 02
A homeless person from Treviso, lits himself a cigarette offered by one of the volunteers while waiting for his tea to cool down. Circa January 2021. Credits: Matteo Bergami

Fig. 03
Two Staffette riding in Piazza VIII Agosto, Bologna, May 2022. Credits: Francesca Sabatini

second is of a more practical sort and concerns the infrastructure of care in the city: volunteers are made aware of the dormitories, help numbers and desks, soup kitchens, and other services and facilities where the homeless may seek for assistance or shelter. With this training work Làbas generates knowledge which, in turn, produces care. An additional, even more relevant process of knowledge production is the one involved in the gatherings following Staffette: before the following week, one volunteer for

each group is asked to write a report on the tour, to keep track of the different situations. The report was born as an internal tool: since volunteers change, they need to be updated on the previous tours to understand who was missing, avoid reiterating questions to the homeless they might have been asked by the previous group, update the stories they are told by the people they met. After more than 15 months of project, it has become a human-centered mapping of homelessness in Bologna. This mapping is of a very peculiar sort for two reasons. The first is that it provides quantifiable information about homeless people: their age, their origin, their status, their legal condition; the second is that it humanizes this information, because it collects the stories behind it.
With the first piece of knowledge produced, Làbas has the objective of making homeless people aware of the services of care in the city (including their own); this dimension is crucial because Làbas claims not to be a charity, but rather to aim to the self-affirmation of the people they are supporting. With the second piece of information, Làbas aims at pointing out the dramatic situation of homelessness to the administration of Bologna and the frailty of its structures, denouncing the lack of an actual strategy to tackle the issue in a structural way.

Fig. 04

The court of Làbas: in the centre, the table where the bags (containing clothing, food, and hot tea) are prepared. In the back, Staffette are ready to start the city tour with their bright-colored harness. May 2022. Credits: Francesca Sabatini

As a urban commons, therefore, Làbas reaches a threefold objective. First, it answers the needs of those who are at the margin: by offering food, giving information on services and shelter, talking to the invisibles, and doing that deep and complex social work that is 'care', it fills an institutional void from the bottom-up. Second, it provides a human-centered mapping of homelessness, which makes up for the total absence of research on the issue, providing a relevant source of direct information, while humanizing those data through stories. Third, they contrast the dominant narrative of wellbeing in the city: in facts, they not only practically address, but overtly signal the dramatic inequality and marginalization the homeless face, thus contributing to political debate in Bologna beyond city branding.

Conclusions

The relevance of Staffette Solidali expands beyond the city of Bologna. The experience of Làbas in fact livens up a debate over the role of the commons in the city, their manifold dynamics of commons and institutions, and the meaning itself of participation and welfare in urban governance. The questioning of city narratives about wellbeing is of crucial importance in the building of a just city: first, because it generates the necessary dissent for a healthy public sphere, as Fraser describes it: "Insofar as the bracketing of social inequalities in deliberation means proceeding as if they don't exist when they do, this does not foster participatory parity. It usually works instead to the advantage of dominant groups in society and to the disadvantage of subordinates. In most cases, it would be more appropriate to unbracket inequalities in the sense of explicitly thematizing them". Second, because it produces an alternative to the current paradigm, which provides services for those who are already empowered. By signaling (and making up for) the failures of the neoliberal welfare State, urban

commons do represent an alternative to State and market. The case of Staffette Solidali is a solid example of how this occurs in the city of Bologna. Being 'alternative', their eventual embeddedness in institutionalized governance causes the risk of de-politicizing the term, as in Bologna (Bianchi 2018): Làbas, being located outside of the institutional Regulation, is both politically and operationally complementary to the municipality.

By positing themselves as alternative and complementary, and not as embedded within the institutions, the commons challenge conventional narratives and have the potential of transforming the institutions themselves: as such, they help understand how we can "foster the idea of the commons as a collective endeavour and a culture of collaboration in the process of rethinking institutions and processes of production of public space". Làbas and the urban commons embody the "3Cs model" of care, commons and citizenship: as said by Euler (2018), 'commoning consists of reproductive and care activities, not only towards other people (and oneself), but to nature. Within this commoning-as-caring, citizens engage in a neglected social work: their experience highlights the absence of a politics of care in the welfare state, for which the major focus is on production rather than on maintaining and repairing both the social and environmental realms; this redistributes among the participants the weight of care as a social work – in this case, towards homeless people. In so doing, it does not alleviate, but rather exacerbates the political tension in the urban context: by taking upon themselves the social work uncovered by the welfare state, commoners as citizens somehow relieve the State of its responsibility to 'care'. And yet, by means of political actions, such experiences become meaningful in that they constantly signal the crucial necessity to introduce an ethics of care in urban governance and to extend participative processes beyond consensus and narratives, in order to fully achieve the common city.

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Collective Design and Production for Caring. Spaces on the Edge as Common Goods Between City and Territory.

Design for territories, Design for social innovation, Common goods, Circular design, Convivial societies

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The progressive fragmentation of communities of inhabitants, understood as collective figures of construction and care of their living environment, is at the base of the decline in the quality of the territory. The current loss of the sense of community exasperates the loss of the activities of proximity, but also the rupture of the millennial co-evolutionary links between human artifacts and nature, fueling a planetary exodus that produces a double effect: on the one hand we see the depopulation of small towns and the abandonment of the defense and care of the rural territory, on the other hand, instead, we observe an increase of inhabitants in the “anonymous” peripheral agglomerations of megacities.
Today, returning to take care of the environment involves the mobilization of local energies able to overturn the hierarchy of consolidated values,

experimenting with renewed forms of local development, based on the enhancement of territorial heritage as a common good. These actions are united by putting into practice the "communing", the management and care of local resources. The aim of this paper is to draw attention to strategic scenarios, theoretical guidelines and examples of good design practices already created or in progress, related to the promotion of ecological and multifunctional agro-tertiary, community neo-cooperatives attentive to the territory, local production systems integrated with ethical values and experiences of co-design, self-organization and social self-construction activators of proximity relationships and productive activities, social and cultural self-managed, highlighting the contribution that a multiscale design can provide in transforming territorial fragility into social and economic opportunities.[1]

Introduction

The progressive fragmentation of communities of inhabitants intended as collaborative forms of construction, enjoyment and care for the surrounding environment is at the root of the decline in quality of the territory, here intentionally defined as the collective and inseparable combination of anthropized settlements, whether urban or rural, and natural landscapes.
The current weakening of the sense of community, a negative consequence of heterodirectional global processes in decision-making, information, production and commerce, emphasizes the practices of de-spatialization and de-territorialization that were already developing in the 20th century[2]. Some examples of these processes are the loss of spaces for social contact[3] or the weakening of

1. The paper is the result of a joint reflection by the authors. However, the paragraphs 1, 2 and 4 are written by M. Manfra, the paragraph 3 by D. Turrini. The paragraph 5 is the result of a joint work by both authors.
2. Alberto Magnaghi, *Il principio territoriale*, (Torino: Bollati Boringhieri, 2020), 53-55.
3. Françoise Choay, *Espacements. Figure di spazi urbani nel tempo*, (Milano: Skira, 2003), 17-31.

neighbourhood activities and convivial relationships[4], or the ever more dramatic breakdown of thousand-year-old co-evolutionary circular connections between manmade production and nature, driving global migration that produces a double effect. On one hand, we are witnessing the depopulation of small towns and the loss of protection and care of rural land, with the disappearance of productive local industries; on the other, we are seeing an increase in marginalized residents on the outskirts of megacities, decontextualized and homologated, along with the related dissolution of public space and the "connective" urbanized social fabric. In both cases, we can observe the emerging phenomena of communities' disaffection and lack of attention to the territory in which they live and work, which ceases to have its fundamental value as a common good and a subject open to new forms of shared planning[5].
Today, starting to care for the environment again entails the mobilization of local energy and community re-identification that is able to overturn an established hierarchy of values. This means redesigning sustainable metabolisms for the social and productive relations necessary to create a new civilization that restores the synergy of co-evolutionary relationships and respect between resident-producers and the quality of their lives, from the countryside to the city. In this regard, this paper intends to redirect attention towards those good practices and common projects that are already consolidated or viable for the immediate future, at different levels and scales, involving the activation of shared forms of knowledge, care and management of territorial goods, both tangible and intangible. These, within the scope of the discipline of design with and for territories, are traceable through a complex grid of innovative local and circular projects, characterized by the

4. Andrè Gorz, *Écologie et liberté* (Paris: Éditions Galilèe, 1977), 45. Ivan Illich, *Tools for Conviviality* (New York: Harper & Row), 34.
5. Carlo Donolo, "I beni comuni presi sul serio," in L'Italia dei beni comuni, ed. Gregorio Arena and Christian Iaione (Roma: Carocci, 2012), 13-54.

activation, in constant growth, of tools for participatory democracy and forms of "place consciousness"[6] for collaborative care of the territory as a common good.
Selected and analyzed projects will regard an ecological agri-tertiary organization, advanced and multifunctional, new village cooperatives and energetic communities that care for the land; innovative and circular productive systems that are integrated with ethical and fair values, as well as being connected with forms of conscious consumerism, aimed at a wider socio-territorial wellbeing; and finally, experiences of co-design, self-organization and grassroots social construction (in the outskirts of cities and marginal areas of regions) that create relationships of proximity and self-managed housing, productive, social and cultural activities.
Based on the discussion and analysis of some of the most innovative contemporary experiences, this study will investigate how the project culture, and in particular the discipline of design, can contribute to protection and care of the territory as a common good, embracing different possible scales of intervention and interest, and establishing itself as a mediator within the new participatory approaches that strengthen the synergical relationship between communities and the surrounding environment, both socially and economically.

New integrated forms of self-sustainable development for the care of rural areas

The territory treated as a common good is the origin of new generation models of self-sustainable local development, that is based on the enhancement of environmental, landscape and socio-cultural heritage, in which productivity, finally detached from the impoverishment and the anthropic domination over nature, no longer depends on a single

6. Giacomo Becattini, *La coscienza dei luoghi, il territorio come soggetto corale*, (Roma: Donzelli, 2015),158-159.

sector, but on the maturation of the consciousness of place and systemic synergies that occur between increasingly integrated and complex supply chains[7].
Active communities of inhabitants-producers, experimenters of new forms of autonomy and collective self-management of territorial resources, assisted by mediators and designers, have begun to independently reconstruct their living and working environments at the edge, but within necessary functional links with urban areas[8], through daily acts composed of re-appropriation, relocation, re-aggregation and plots "forthcoming", which weave the rediscovery of traditional knowledge with the most recent social and technological innovations[9]. Positioning itself as an important activity for a "return to the land"[10], advanced and multifunctional neo-agriculture, for example, restores centrality to peripheral territories thanks both to the intrinsic plural functions of co-production with nature, and to the complementarity between city and countryside, the latter pursued primarily through agri-food markets as alternative to the conventional ones, or incorporated in new networks of production and consumption, based on direct relationships and proximity, solidarity and responsibility, as key elements in the qualification of products[11]. Deriving from the culture of local food and slow food presidia, the "local food societies" are examples which, as Alberto Magnaghi argues, "revitalize and

7. Anna Rizzo, *I paesi invisibili. Manifesto sentimentale e politico per salvare i borghi d'Italia*, (Milano: Il Saggiatore, 2022), 113-117.
8. Sabrina Lucatelli and Giulia Valeria Sonzogno, "Confini, sviluppo locale e relazioni aree interne/aree urbane. L'esperienza Snai e i legami tra territori," in *Metromontagna: un progetto per riabitare l'Italia*, ed. Filippo Barbera and Antonio De Rossi (Roma: Donzelli, 2021).
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10. Peter M. Rosset and Miguel Altieri, *Agroecology. Science and Politics*, (Rugby: Practical Action, 2017), 71-76.
11. Alessandra Corrado and Carlotta Ebbreo, "Terra," Corrado, Alessandra and Ebbreo, Carlotta. "Terra," in *Manifesto per riabitare l'Italia*, ed. Domenico Cersosimo and Carmine Donzelli (Roma: Donzelli, 2020), 219-223.

complexify local economic systems connected to small towns and villages, founded on the recovery of cultivar and historical productions; paths of "retro-innovation" which, starting from food, have contributed to redefining and reconstructing local cultural, artistic and communicative production systems that are complex and integrated at the local level"[12]. This is the case of the French AMAP (Association pour le maintien d'une agriculture paysanne), which can be considered as an economically efficient, simple and local answer to the double question of finding healthy products and the concomitant need to develop ecosystem and eco-territorial services[13]. Through its very operation, each AMAP illustrates the principle of the short supply chain, which decreases the ecological cost of consumer products; it provides a diversified food set, in harmony with the seasons, of high quality, at a price that is accessible to all; it is part of a program of food balance, therefore of health; and it constitutes, finally, a value well identified in the ecological debate and in the care of landscapes. An AMAP can also be considered as the emblem of a wider system, where the grid of new values, such as the quality of food and water, air and soil, of public services, of the ways of sharing production goods, constitutes a real political project marked by the territory[14]. Incredible Edible Todmorden is instead the political-project initiative of a town in the United Kingdom that has promoted the creation of self-managed gardens throughout the inhabited area starting from the phenomenon of Guerrilla gardening, i.e. the appropriation of outdoor

12. Magnaghi, *op. cit.*, 229.
13 Daniela Poli, "Tracciare la rotta per iscrivere i servizi ecosistemici nella pianificazione bioregionale," in *I servizi ecosistemici nella pianificazione bioregionale*, ed. Daniela Poli (Firenze: Firenze university press, 2020), 129-135.
14. Gilles Clément, *L'Alternativa ambiente*, (Macerata: Quodlibet, 2015), 28-29.
15. Elena Granata, *Biodivercity. Città aperte, creative e sostenibili che cambiano il mondo*, (Bra-Firenze: Slow Food-Giunti, 2019) 111-114.
16. Franco Fassio, Elisa Cionchi and Alice Tondella, "The Circular Economy for Food in Future cities. Good Practices that Define Smart Food," *AGATHON - International Journal of Architecture, Art and Design 8 (2020):* 251.

public spaces for the production of food[15]. The activity currently involves a variety of public and private stakeholders on various fronts. The local medical center, for example, has created an apothecary garden, while a housing cooperative has launched a project that offers its clients a welcome kit with seeds and a guide to start growing. In fact, the "edible landscape"[16] has many benefits, including reconnecting city residents to self-produce food, promoting a healthier lifestyle, aesthetically enhancing the landscape, educating, empowering and stimulating participation in community life.
The multi-functionality of the production processes of neo-agriculture also requires the activation of systemic paths that, starting from a single agro-food product, creatively extend to other local cultivar and, above all, from the primary sector to the craft and advanced tertiary sectors, activating an "integrated design"[17]. With the same relational perspective, the neo-cooperatives of community are emblematic in this regard, which are not content to promote a political and ideological instance but propose a responsive common action that gives life to diversified local activities, totally collaborative[18]. This associative model connects principles of trust, responsibility, subsidiarity, mutuality and shared investment through an initial group of co-designing inhabitants and volunteers who take charge of developing services, products, processes and welfare for the whole territory[19]. The objectives of these participatory visions are to produce value through economic initiatives capable of guaranteeing income independently of

17. Filippo Barbera and Antonio De Rossi, "Per un progetto metromontano," in *Metromontagna: un progetto per riabitare l'Italia*, ed. Filippo Barbera and Antonio De Rossi (Roma: Donzelli, 2021), 24.
18. Giovanni Teneggi, "Cooperazione," in *Manifesto per riabitare l'Italia* (Roma: Donzelli, 2020), 103-107.
19. Dario Scodeller, Eleonora Trivellin, Davide Turrini, Marco Manfra, "Design for Social Innovation in Italian Inner Peripheries," in *The Ecological Turn. Design, Architecture and Aesthetics beyond the "Anthropocene"*, ed. Loreno Arboritanza, Anna Chiara Benedetti, Karilene Rochnik Costa, Simone Gheduzzi, Rosa Grasso, Ivano Gorzanelli, Simona Rinaldi, Ilaria Ruggeri, Laura Succini and Ilaria Zedda. (Delft – Bologna: TU Delft Open – CPCL Journal, 2022), 408-426.

welfare programs, to promote territorial valorization by recovering the identity of the place, to take care of and protect the common territorial material and immaterial goods. Particularly fitting cases of collaborative practice in this context are those of the Emilian Apennine villages of Succiso and Cerreto Alpi, in which are constituted "cooperative country" with the aim of restoring activities and places of sociality and service, but also to evolve into the supply chain agri-food co-production capable of reinvigorating the opportunities and local working conditions, interrupting the emigration of young people towards the valley and even allowing them to return[20]. What emerges, then, is a flourishing of "imprese abitanti"[21] that allows different people to be proactive and creative in defining common productive initiatives, supplied that the idea of economic "yield" also contemplates the impact on other living beings, from inhabitants to consumers, from animals to plants, and their intimate "connection of meaning"[22].

In this co-evolutionary vision between the development of production and community development are also located the emerging community energy, which, incorporating the European RED II (2018/2001/EU)[23], reinterpret the local territory as a potential scenario for self-sufficiency and energy sovereignty[24]. These are

20. Teneggi, "Cooperative di comunità: fare economia nelle aree interne," in *Riabitare l'Italia: le aree interne tra abbandoni e riconquiste*, ed. Antonio De Rossi (Roma: Donzelli, 2018), 297-306.
21. In an interview of July 2021, Giovanni Teneggi, scientific director of Appennino l'Hub, defined the "impresa abitante" (inhabitant enterprises) as follows: "[...] it is the enterprise that builds its own place. It is no longer enough for local businesses to stay in a place or use its resources. Places need engineers, builders; [...] The "impresa abitante" is the enterprise that builds by involving its production and business processes with everything that makes its place."
22. Jan Douwe van der Ploeg, *I nuovi contadini. Le campagne e le risposte alla globalizzazione*, (Roma: Donzelli, 2009), 72-89.
23. The Europea RED II (2018/2001/UE) is available at: https://eur-lex.europa.eu/legal-content/IT/TXT/PDF/?uri=CELEX:32018L2001
24. Giorgio Osti, *Storage and Scarcity. New Practices for Food, Energy and Water* (London-New York: Routledge, 2016), 97-135. Giovanni Carrosio, "Economia civile e gestione delle risorse ambientali nelle aree interne," in *Metromontagna: un progetto per riabitare l'Italia*, ed. Filippo Barbera and Antonio De Rossi (Roma: Donzelli, 2021), 115-121.
25. A smart grid is a small to medium-sized network system that allows the autonomous redistribution of electricity between the different nodes connected as required.

groups of inhabitants and companies that, using the innovative shared network systems called smart grid[25], unite in a single legal entity for self-production, self-consumption and sale of surplus energy produced from renewable sources. The transition of energy production, distribution and consumption from a heterodirected and centralized model to a polycentric self-directed one by the local community, which becomes prosumer, is the main cultural innovation that has recently involved the small Sardinian municipalities of Villanovaforru and Ussaramanna, which, in the positive wake of what has been done so far by the first Italian energy community, that of Magliano Alpi (CN), have formed "Renewable Energy Communities" (CER) capable of generating both social dynamism, economic revitalization and care of the territory.

Local and circular production systems aimed at socio-territorial well-being

Finalized to the welfare of the inhabitants, a cultural change towards social, solidarity, relational management of the local territorial production system calls for the development of principles of an economy oriented to circularity and ethically managed, based on concrete experiments of alternative or parallel economies to the capitalist market[26].
Reconnecting the sustainable management of environmental assets with production systems means, for example, reintroducing indigenous natural materials and by-products in some supply chains such as green building, textile manufacturing and design manufacturing with high added value of knowledge and creativity. Although not yet able to cover large market segments, there are already some experiences, more or less structured, that move on the

26. Andrea Segrè, *Economia a colori* (Torino: Einaudi, 2012), 17-39.
27. Alberto Magnaghi, *Il progetto locale. Verso la coscienza di luogo* (orino: Bollati Boringhieri, 2010), 75.

circularity front, stimulating the enhancement and care of the territorial milieu[27]. Think of circular economy initiatives that include the forest-wood chain on a local scale, as in the case of experiences of sustainable forest management through enhancement plans that look at the connections between marginal areas and cities. Examples are the emerging "forest condominium" in Val Pesarina (UD), which connects forest management with biomass heating in Pordenone, and the biomass supply chain in Campo Ligure (GE), which provides chipped wood to the greenhouses of basil cultivation in Prà, on the west coast of Liguria[28]. Or just think of the small food chains of nutraceutics, which, recovering ancient varieties of vegetable production, aim to be "custodians of the territory", or those who produce ecological and biodegradable textiles conceived from the transformation of by-products of local fruit growing without using virgin raw material. In this direction, the Sicilian company Orange Fiber, reducing waste and eliminating disposal costs, processes hundreds of thousands of tons of by-product of the regional citrus supply chain, converting it into a resource for the world of fashion, creating an innovative fabric.
VAIA, on the other hand, is a local circular economy project based on a business model attentive indeed to the needs of people, but also to the development of dynamic relationships between nature and the territory, to which are added more distinct components of stimulation of individual and collective creativity, as well as communicative impact on the visual stage of socio-environmental actions certainly far from greenwashing phenomena. Conceived by

28. Carrosio, "Metromontagna, cambiamento climatico e transizione ecologica," in Metromontagna: un progetto per riabitare l'Italia, ed. Filippo Barbera and Antonio De Rossi (Roma: Donzelli, 2021), 163-169.
29. Vaia storm was an extreme weather event that affected north-eastern Italy (almost essentially the mountainous area of the Dolomites and the Venetian Pre-Alps) following a strong turbulence of Atlantic origin, which brought extremely strong winds and persistent rainfall to the region from 26 October 2018 until 30 October, causing millions of trees to crash to the ground, with the consequent destruction of tens of thousands of hectares of alpine coniferous forests.

Federico Stefani from Trentino, the project is aimed at collecting and reusing trees uprooted during the 2018 Vaia storm in Triveneto[29] and transforming them into a finished product, namely a passive amplifier for smartphones that exploits the natural resonance typical of fir wood. Launched in 2019, "Vaia Cube" becomes an emblem of a design at the service of adaptation to climate change, acting pragmatically through a design action capable of recreating value not only for the environment, since for each amplifier sold a new tree is replanted in order to give new life to the woods, but also for local labor, entrusting the enforceability of the product solely to the knowledge of wood craftsmen in the areas affected by Vaia[30].
These new experiences, which innovate by reconstructing a relationship of co-production between man and environment, play a central role in the development of a circular and collaborative economy able to bring back, as Ernst Friedrich Schumacher claimed ahead of time, the man at the center of a more equitable productive action[31], allowing to experiment sustainable solutions in the field of production and consumption, safeguarding at the same time landscapes and biodiversity.

Social innovation, active citizenship, regeneration of urban commons

Urban spaces and services of common interest have always concurred to the satisfaction of the many needs of living in the city. Functional to the quality of community life and the exercise of individual rights of citizenship, such as sharing and sociality, they are living today a moment of

30. Arianna Mion, "Come la tempesta Vaia sia diventata tangibile poesia. Design e cambiamento climatico si incontrano in un cubo di legno," *Officina** 31 (2020): 90-93.
31. Ernst Friedrich Schumacher, *Small Is Beautiful. A Study of Economics as if People Mattered* (London: Blond and Briggs, 1973), 61-106.
32. Roger Keil, *Suburban Planet. Making the World Urban from the Outside In*, 140-142; Brenner, *New Urban Spaces: Urban Theory and the Scale Question* (Cambridge MA: Polity, 2017), 171-205.
33. Christian Iaione, "Città e beni comuni," in *L'Italia dei beni comuni*, ed. Gregorio Arena and Christian Iaione (Roma: Carocci, 2012), 109-148.

deep crisis, exacerbated on one hand by the lack of design of public infrastructure, both in their infrastructure, as in that of their maintenance[32], on the other hand by the attitude of spoliation of ownership and responsibility by citizens towards the space of collective use, more and more perceived as a place of no one, rather than a place of all as a common urban space[33].
Countering the degrading characteristics of planetary urbanization, such as the conditions of neglect, isolation and socio-economic gap experienced in the suburbs of megacities, requires the development of strong experimentation of alternative cultures of living towards the construction of a new urbanity that, relying on bottom-up energies, is able to return appropriate forms of planning and democracy to the settled communities. The real challenge to be taken up will be in the field of a design with and for the territories concretely centered both on the concept of "common social good", i.e. on a network of interactions composed of mutual trust, widespread skills and capability of generating sociality[34], and on that of "intentional common good", that is on a tangible, accessible and shared heritage that emerges from a project activity, allowing the unfolding of social life by feeding and regenerating the communities of place and project[35].
This ground for reflection can be linked to that of many theorists and critics, from Henri Lefebvre to Lewis Mumford, Charles Landry and Richard Sennett, who, although starting from different points of view and developing dissimilar articulations of thoughts, agree on the fact that urban quality depends on the need for a close relationship, more or less dialogical, between the

34. Elinor Ostrom, *Governing the Commons. The Evolution of Institutions for Collective Action* (Cambridge: Cambridge University press, 1990), 2-28.
35. Ezio Manzini, *Abitare la prossimità. Idee per la città dei 15 minuti* (Milano: Egea, 2021), 13-14.
36. Lewis Mumford, *The city in History* (London: Secker & Warburg, 1961), 650-658. Lefebvre, *Le droit à la ville* (Paris: Anthropos, 1968), 30.
32; Charles Landry, *The Creative City. A Toolkit for Urban Innovators* (London-Sterling VA: Routledge, 2012), 20-31. Richard Sennett, *Costruire e abitare. Etica per la città* (Milano: Feltrinelli, 2018)*, 190-215.*
37. Sennett, *op. cit.,* 11.

built environment and the lived one, and that it rises as the combinations of people, events and social forms increase[36]. It is Richard Sennett, for example, who re-proposes the ancient meanings of “Ville” and “Cité”, with which he highlights the double and inseparable link between the built land and the way people live and inhabit it: the “Ville” is seen as a set of material artifacts such as streets, squares, parks and technical infrastructure, while the “Cité” is the superstructure made of behaviors, meetings, conversations and emerging communities[37]. It is clear that, since it is a circular relationship in which the links of cause and effect act in both directions, from the “Ville” to the “Cité” and from the “Cité” to the “Ville”, to improve the “Ville” the aggregative action of the “Cité” is necessary and, vice versa, to regenerate the “Cité” it is necessary to rethink a richer and more diverse “Ville”.
At the same time, care of place, sense of community, and motivation to collaborate cannot be designed directly but conditions conducive to their existence can be conceived. This requires rethinking material and digital environments and artifacts that make them reified and practically possible, where the affordance[38] in question, which is of most interest here, is one that invites people to come together to build a new collaborative democracy. In the places of sharing that are thus created, true design innovation occurs as much in the ways in which spaces and structures are transformed as in the exchanges and relationships, certainly self-produced, to overcome social desertification. These are, in fact, processes in which the figures of the designer, the producer and the inhabitant are modified and realized through shared roles and

38. Formalized by psychologist James Gibson in 1979 in his book 'The Ecological Approach to Visual Perception', the notion of affordance is considered: “a property of an object or an aspect of the environment, especially relating to its potential utility, which can be inferred from visual or other perceptual signals; (more generally) a quality or utility which is readily apparent or available.”
39. Marco Manfra and Davide Turrini, “Periferie baricentriche. Modelli progettuali di design per l’innovazione sociale,” MD Journal 11 (2021): 187-189.

responsibilities, thanks to spheres of competence that at times overlap and merge, which are carried out from time to time in the blurred and fluid identities of the promoter or the facilitator, of the co-designer or the co-user destined to converge towards a completely open concept of the project[39].

To give more concreteness to what has been said so far, we can consider as a significant case study, unconventional and participatory, the project "Community Facilities System" in the barrio of Los Frailes de Catia (Caracas) conceived by PICO Colectivo. In 2015, working on the legitimacy of informal settlements and promoting community empowerment through protocols of social and environmental coexistence, three infrastructures were co-designed, as connective and multi-purpose, capable of eradicating different typological stereotypes: a Reduced Sport Court that challenges the competitive and performative models depopulating in the conventional city, an Open Parliament articulated in a circuit of shared terraces and meeting stands, where community identity expressions are made explicit with forms of collection and structuring of social instances, and finally, a Path Square that uses a residual space for the implementation of permanent workshops, open to citizenship, on the management of ecosystems of proximity and the care of the adjacent Waraira Repano National Park[40].

In the same direction, in the Mediterranean area, independent collectives of designers, architects and landscapists design convivial spaces characterized by functional elements imagined and self-built by the inhabitants. This is the case, for example, of the Orizzontale collective, which,

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40. Giovanni Comoglio, "PICO Colectivo. City-making ribelle in Venezuela," https://www.domusweb.it/it/architettura/gallery/2020/04/21/pico-colectivo-city-making-ribelle-in-america-latina.html, 1.
41. The "Carte du Bien Commun" is a cartographic tool developed by COLOCO for the construction of a shared and multiple knowledge of the territory. In this way, planners, residents, technicians, association and stakeholders in territorial planning build together a knowledge of the territory and develop project strategies through dialogue and enhancement of the territorial commons.

based on a non-authorial but open, spontaneous, relational design approach, conceived as a continuum of ideas and small acts arising from below, experiments throughout Europe with renewed ways of fruition of public space, actively stimulating practices of shared care and expressions of belonging; or the Atelier COLOCO, which directly involves communities in the design of gardens, parks, urban gardens and other meeting places, both through artistic and performative activities, and through the use of experimental cartographic tools such as the "Carte du Bien Commun"[41] (Map of the Common Good).

In Barcelona, since 2013, to be redesigned in many suburbs has instead been private mobility, with consequent benefits in terms of widespread social inclusion: pedestrianized or cyclable macro-isolates are in fact the basis of the project "Superilles Social" of the Municipal Directorate for Social Innovation, which, since 2017, provides proximity services for the elderly and children, from public space to private homes, inspired by the pioneering widespread home care "Buurtzorg", born in 2006 in the Netherlands, by a group of nurses led by Jos de Blok. On the operative level, the streets have been transformed into mixed-use and shared public spaces through interventions implemented in a light and reversible form, where different citizens can meet and discuss generative collective activities.

Over the next few years, the Supersilles model will be progressively expanded with the participation of the residents, creating a network of 21 green hubs and 21 neighborhood plazas, and gaining 33.4 acres of pedestrian space and an additional 6.6 acres of green space[42].

The examined cases can be seen as concrete steps towards an ideal city, in which even

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42. Barcelona City Council press release, 11th November 2020: Ajuntament de Barcelona, Cap a la Superilla Barcelona, https://ajuntament.barcelona.cat

43. Ezio Manzini, *Politiche del quotidiano. Progetti di vita che cambiano il mondo* (Roma: Edizioni Comunità, 2018), 105-143

marginal spaces can become attractive and projective cores of diversified behaviors, crucibles of multiple experiences, catalysts of conversations, projects and communities. They are in fact these encounters and the social forms that derive from them that produce the political and design energies necessary for megacities to evolve towards sustainability[43].

Conclusions

As it emerges from the contribution, the culture of the project and in particular a multidisciplinary, participatory and creative design, increasingly understood as a collective, strategic, political, place-based process of problem solving or reframing, can contribute to the care and social and economic reactivation of peripheral territories, rural and urban, in many ways: from the definition of political strategies and guidelines for the enhancement of the so-called "territorial heritage"[44] of cultural, social, productive, environmental nature, to the realization of services and products to protect tangible and intangible common goods, to the configuration or reconfiguration of working groups, processes and activities for new community weavings.
Whether in the countryside or in the city, the varied and multiple experiences reported in the discussion, true counter-stories of a "return to the territory"[45], show how the "margins" can be progressively transformed into new centers of vital significance and, therefore, become new experimental cores for sustainable territorial development. Thus, thanks to the unavoidability of a contemporary "place consciousness", which alludes both to the design of local production systems based on the incremental enhancement of the value of the territory as a common good, and to the new relational forms of active

44. Magnaghi, *op. cit.*, 300.
45. Francesco Curci and Arturo Lanzani, "Le Italie in contrazione, tra crisi e opportunità," in *Riabitare l'Italia: le aree interne tra abbandoni e riconquiste*, ed. Antonio De Rossi (Roma: Donzelli, 2018), 79-110.

citizenship and self-management, a part of the peripheral places resurrects, in a convergence between active citizens already present or resettled, planners, local administrations, cooperatives or individual entrepreneurs capable of experimenting good policies and good practices, innovative and adaptive.
Interweaving values related to the care of relationships between individuals and with the surrounding environment, such as solidarity and the recovery of synergistic and co-evolutionary relationships between human settlement and nature, these new forms of "ecological communities"[46] reappropriate the sense of community and spaces on the edge, recreating places of contact, proximity activities, relations of conviviality, planning and circular economies in which the notion of capital is also social and cultural[47].
In the context outlined above, within the limits imposed by some local administrations that are often anchored to a concept of closed local communitarianism, in fact opposing the initiatives of innovation that have been highlighted here, the discipline of design, in the right mix between top-down and bottom-up design paths, will have to reflect more and more on the ability to connect people, places, institutions and businesses and, in designing the tools to bring different actors into dialogue, on the possibility of giving communities the ability to become, themselves, autonomous bearers of innovation, projecting them into a world of supportive communities, linked to social, fundamental, circular and ecological economies.

46. Fritjof Capra and Ugo Mattei, *Ecologia del diritto. Scienza, politica e beni comuni* (Sansepolcro: Aboca, 2017), 183.
47. Marco Manfra and Davide Turrini, "Towards a New ResilienceCulture. Relational Design and Workshop of Social Innovation for Fragile Areas in Central-southern Italy," in Resilience Between Mitigation and Adaption, ed. Fabrizio Tucci and Cesare Sposito (Palermo: Palermo University Press, 2020), 337.

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S.01
GROUNDS

Design for Urban Recovery and Long-term Resilience Through Groundworks. Approaching the Fragilities of Two Dutch Neglected Neighborhoods.

Nature-based solutions; Resources; Urban regeneration; Process-oriented Design; Regeneration of grounds

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The contribution aims to display how the use of Nature-Based Solutions (NBS) and resource circularity can be framed as regeneration and care tools for grounds as a typological element between architecture and the city. Moreover, the article shows how the simultaneous application of the two approaches can lead to a connection between community and site relating grounds care practices with a long-term resilience perspective. Following this, it is essential to trace a common perspective toward the necessity for an environmental rebalancing, to restore abandoned and depleted grounds through design action.
Therefore, the contribution will highlight how a renewed sensitivity to climatic and environmental issues requires a design answer not to have a technocratic but a human-centered approach, overcoming the rhetoric of sustainability and approaching the groundworks as a focal element of the project. Specifically, through the presentation of two case studies – De Ceuvel by Space&Matter and the

Luchtsingel system by ZUS – considered emblematic for their effectiveness and radicality, the article will stress how groundworks could be a driver in stressing the relationship between man, environment, and resources.

An unbalanced framework

The convergence of simultaneous changes – climatic, social, economic, and technological – with an increasing speed of the transformations taking place highlights the incremental 'Great Acceleration'[1] in which human action influences structural changes in spaces and relations. The concept of Anthropocene itself spread in the last decades, portraying the human influence on geological, territorial, and climate modifications. Indeed, the mentioned changes show a radical and transversal mutation that is running at such a speed that the urban and architectural project seems unable to respond effectively.
Among the many changes, climate change is considered a focal issue both for academia and political agendas. This contribution considers it according to the conception in which the climate crisis is not only perceived as an emergency phenomenon of discontinuity for the previous environmental context, but it defines a new paradigm within which the global system develops[2]. This change of perspective, also supported by the reports of the Intragovernmental Panel on Climate Change[3], highlights both the unstoppable potential of the fallout due to climate change and the need to structure a renewed project system capable of interacting coherently with the new paradigm. Furthermore, increasing climate hazards,

1. Will Steffen, et al., "The Trajectory of the Anthropocene: The Great Acceleration", *Anthropocene Review* Vol. II, 1 (2015): 81-98
2. Mattia Bertin, Denis Maragno, Francesco Musco, "Pianificare l'adattamento al cambiamento climatico come gestione di una macro-emergenza locale", *Territorio* 89, 2 (2019): 138-144.
3. IPCC, *Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. (Geneva: IPCC, 2014); IPCC [Masson-Delmotte, V., P. Zhai, A. Pirani, S. L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M. I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T. K. Maycock, T. Waterfield, O. Yelekçi, R. Yu and B. Zhou (eds.)]., *Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*. (Cambridge University Press. In Press.: 2021)

such as the heat island effect, floods, hurricanes, and droughts, together with social injustices, economic crises, and pandemics, are shaping the current era, affecting people and spaces, tracing an unbalanced framework. This is urging for a rethinking of human action, even overcoming the separation between culture and nature[4], necessary to face the changes underway.

Here, the role of design needs to be declared and refocused in a perspective of possible modification and care of the space, acting on the built environment and in those neglected and fragile fragments of territory. Indeed, the growing unstable condition defines a systemic fragility, outlining a condition of instability and crisis that highlights the conflictual relationship between societies, man, and the environment.

Although these issues are pervasive everywhere, the effects of climate hazards and economic crises seem to worsen within urban areas[5]. Here it is possible to find a stratification of problems due to climate-related fragilities, generally overlapped on previously unstable socio-spatial contexts such as peripheral or abandoned areas.

These are the urban areas where the sprawl effects and the widespread diffusion of productive plants of the preceding decades have left polluted, neglected, and damaged soils. Due to this modified human-environment balance[6], it is urgent to implement strategies that can act on grounds, implementing caring actions toward spatial resilience where groundworks could have a crucial role in defining resilient urban configurations.

This complex condition defines the research framework, which considers the neglected urban areas that suffer from a double fragility: spatial and social. Thus, they shape a depleted territory where the ground could play an essential role in activating regeneration dynamics, producing a new form of the

4. Bruno Latour, “La crise sanitaire incite à se préparer à la mutation climatique”, *Le Monde.* (2020, January 4).
5. Harriet Bulkeley, *Cities and Climate Change* (New York: Routledge, 2013).
6. Lance Gunderson, Craig Allen and Crawford Holling (Eds.), *Foundations of Ecological Resilience* (Washington: Island Press, 2009).

urban ecosystem.
Indeed, even if the design and regeneration of the ground will not heal the environment from climate change relapses, it could help adapt cities and shape a renewed society.
A reflection of the role of grounds regeneration for contemporaneity defines a crucial position. Indeed, it means to value it with the potential to restore and give back to the city spaces that have been depleted in the previous century, so acting on the physical level of the project. At the same time, it allows reflecting on the importance that ground could have in narrowing the relationship between local communities and care actions, so operating on an immaterial level of the project. In other words, the article will display how the ground design can constitute a perspective of socio-environmental resilience capable of interacting with the climate upheavals and the social frictions that characterize the urban space[7].
Starting from the unbalanced framework of our contemporary that has been traced, the research exposes the potentiality of regeneration, focusing on the importance of the ground. Through the presentation of two case studies, it will show a design perspective where the project becomes a possibility to rediscover a closer relationship between the city's minerality and the ground's naturality, implementing community actions that foster social cohesion.
Specifically, to present this design perspective, the study shows two Dutch projects that address ground regeneration and a reactivation of the local social life, framing the implementation of community action as a crucial issue to design new resilient grounds and transmit the importance of the local care. The two projects – De Ceuvel and Luchtpark Hofbogen, respectively by the architectural and urban design offices Space&Matter and ZUS – are then analyzed, highlighting their design approaches, in which it is visible the application of Nature-Based Solutions to restore grounds and the Circularity as a renewed

7. Gabriele Pasqui, “Socio-spatial Inequalities” in *Urban Peripheries: the Case of Italy*, in Risk and Resilience, Socio-Spatial and Environmental Challenges, ed. Alessandro Balducci, Daniele Chiffi, Francesco Curci (Milan: Polimi Springer Briefs, 2020)

design mindset to work with local and apparently unused resources, where also the regeneration of polluted soils and neglected areas can configure urban reuse toward a circular city perspective.

State of the art

During the last decades, various solutions have begun to spread, interacting with different types of fragility, deepening the consciousness of the relationship between ecology, energy, and design. Specifically, in recent years, two main strategies have acquired centrality: the so-called Nature-Based Solutions (NBS) and the Circular Economy (CE). This is also thanks to international attention and some European research programs[8] that fostered the initiatives about these two strategies. Regarding them, it is relevant to understand how these two tools can be framed as resilient instruments to face a broad set of fragilities, climatic at first.
Hereby, NBS and CE are not presented as punctual technical solutions, rather considered in their ability to produce ecosystemic effects[9].
Before analyzing them, it is first necessary to state how NBS and CE could be applied at various scales, relating to different approaches (Figure 01).
Indeed, they are general approaches that consider various strategies and solutions, which refer to specific scales of the project.
Nature-Based Solutions frame a broad set of actions using vegetation as a catalyzer for regeneration and adaptation. On the other hand, Circularity gathers a series of strategies that focus on the usage and flow of resources, trying to rethink the concept of waste into a new valuable source.
The contribution will focus on applying the two

8. With respect to the theme of nature-based solutions, an important role was played by the research funding by the Horizon 2020 program, as well as a series of project initiatives implemented in various European cities. Similarly, circularity has seen a great attention thanks to the work carried out by the Ellen MacArthur Foundation, and to a growing and consequent centrality also within the European agenda, both with respect to the development of territorial policies, and in the attempt to rethink the approach to the built environment.
9. Ellen McArthur foundation, ed. “Circular Economy in Cities.” How to Build a Circular Economy. Accessed September 27, 2021. https://ellenmacarthurfoundation.org/circular-economy-in-cities.

strategies at the neighborhood scale, considering it as a point of inflexion between plan and project[10] and highlighting the relation between territory and architecture.
Finally, the article will conclude with a reflection on the concept of long-term resilience.

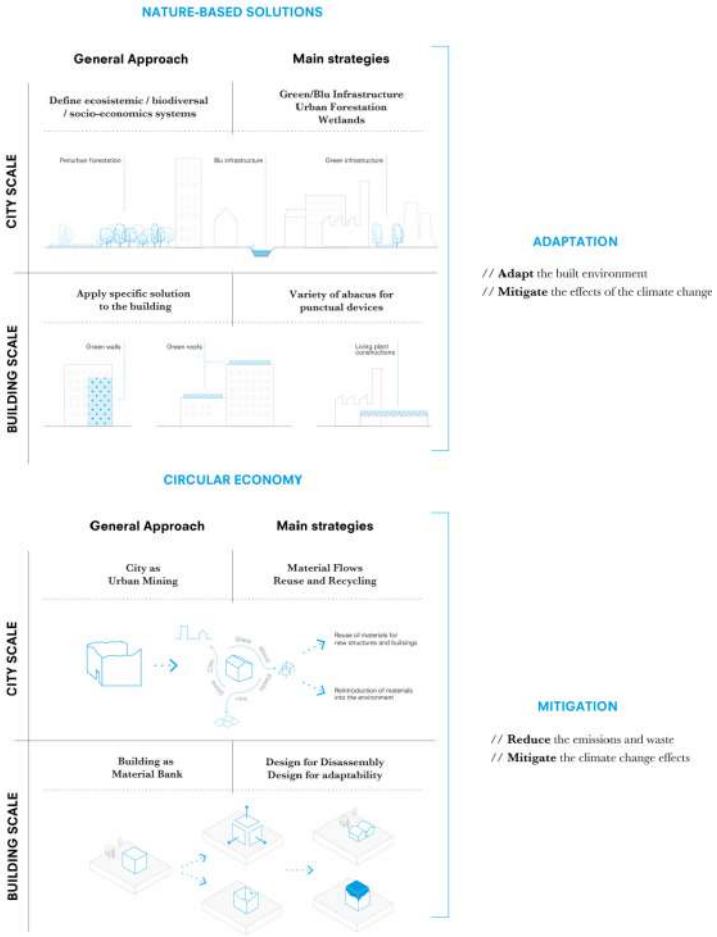

Fig. 01
Schematic representation of the different approaches regarding the two design strategies.
Credits: Kevin Santus

10. Vittorio Gregotti, *Il territorio dell'architettura* (Milano: Feltrinelli, 1988).

A design perspective

Groundworks, at first, is an operative action on space. This implies a focal role for the project, which can directly act on the city's space, reshaping it and relating the climate crisis with a possible spatial modification. The two presented projects - De Ceuvel by Space&Matter and Luchtsingel by ZUS - underline this willingness concerning a regenerative aim, combining socio-ecological actions in approaches that increase the ecosystemic potential and at the same time act on the physical level of the city.
Focusing on groundworks, both projects show an ongoing reappropriation of the urban space, which also becomes an adaptive and public space for the city. The De Ceuvel restores an abandoned area through a long-term reclamation of the land, designing new public spaces by reusing former houseboats, and defining a new community bonded to ground regeneration (Figure 02).
Specifically, the project deals with the regeneration of one of the polluted docks of the former industrial area of the city harbour of Amsterdam Noord. Here, the studio Space&Matter, together with the landscape architect firm DELVA, applied a long-term reclamation process started in 2014, using nature as a regeneration tool of the ground, specifically through phytoremediation. This operation tries to regenerate and restore the neighbourhood's natural capital, acting on removing pollutants from the dock's ground to make it a renewed common space for the city.
Indeed, ground reclamation was the starting action that could enable the activities to return to place. The process of re-inhabitation of the dock was then conducted with a group of young entrepreneurs that needed new working and creative spaces. To do so, having the necessity of proceeding with the reclamation of the polluted soil, Space&Matter decided to apply circular logic by sharing and reusing the city's physical assets. Indeed, the masterplan presets retrofitted houseboats connected through a raised element, configuring a promenade that interacts with the neighborhood scale, producing new public spaces, and detaching the public/walkable layer from the regenerating ground.
Integrating circular logic aimed at effectively using

Fig. 02
The project shows a new relation with the ground: a place to reclaim and a new urban neighborhood; the new living spaces are designed by reusing former houseboats. Space&Matter. Photo courtesy by Space&Matter.

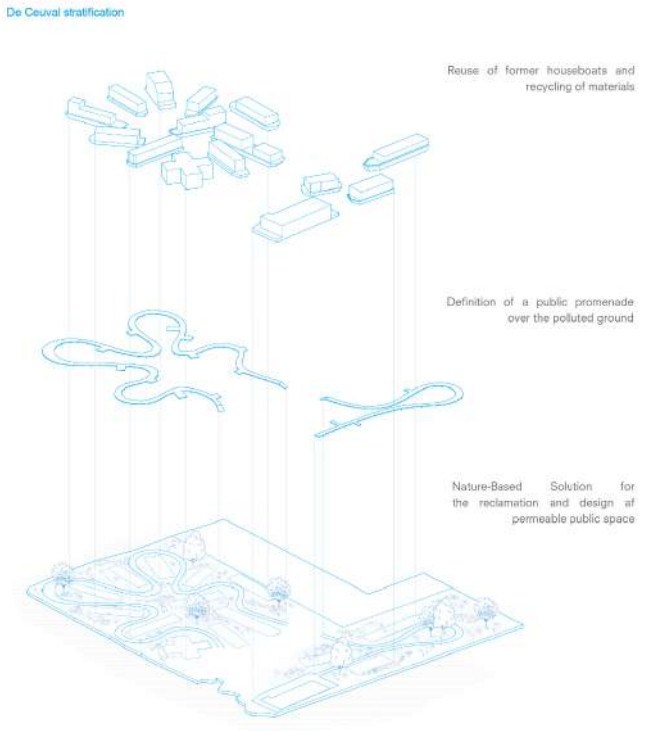

Fig. 03
Layering of design strategies. Credits: Kevin Santus

local resources with systems that consider nature as a project tool, in which the design effects are evidence of the circular idea of "reduce, reuse, recycle". (Figure 03).
The second project, the Luchtsingel, shows an urban intervention where reusing building rooftops and re-naturalising some parts of the city soils generated a new urban ecosystem. The project is settled in Rotterdam and aims to reconnect three city districts through an urban bridge, implementing green public areas to restore the neglected landscape close to the railway. The main idea consists of a pedestrian bridge that runs through the city, creating a two-kilometers long promenade.
Some points acquired higher importance within this promenade, as exemplified by the Luchtpark Hofbogen that is configured as a green area regenerating the rooftop of the former (Figure04).
This is a green area that regenerated the rooftop of the former Hofplein Station. Greenery, events, and picnics occurred in the new urban park, revitalizing the local community and giving new social life to the neighbourhood. Moreover, the area acquired a new ecological value for the city, implementing green spaces and acting on the city's biodiversity. Finally, the design action could be synthesized in creating an artificial urban ground on the rooftop, where again, the role of groundworks seems to characterize a

Fig. 04

The rooftop of the former Hofplein Station is transformed in a urban field, where the urban and natural experience touches. Credits: Kevin Santus

perspective that keeps together physical and social interventions.
Indeed, the project shows how the re-connection of public spaces, also reusing rooftops as artificial grounds for urban gardens, reactivates social dynamics and produces a closer relationship between people and the environment. Moreover, the social action of care is mediated since the beginning of the project, where the local community financed the project through a crowdfunding movement. This idea of participation made close the relationship between the citizen and the regenerated place also involving them in the process of maintenance, so of care,
The ground design in this project displays the dual nature of urban grounds. These are both the city soil and the rethinking of rooftops to settle new functions such as local production of vegetables and strengthening of community relations.
As shown, the combination of CE and NBS express alchemy that opens to the possibility of repairing and sustaining grounds, relating to the theme of regeneration as a growing and adaptive instrument, anchoring the project in its specific urban landscape, intimately entangled with the community process among the sites. Thus, producing practices of coexistence and care between grounds and inhabitants.

Design and care: defining a long-term resiliency approach

The two projects show how the scope of the CE and NBS is not a temporary space recovery or a temporary solution. Instead, they are used to tackle the systemic network where the restoration and care of the ground can design new places for communities and build environmental sensibility among people. As displayed by the case studies, grounds are considered as primary elements for the project, and their reclamation and care are the first steps toward a circular design and reactivation of the neighborhood. The CE becomes a lens for observing the site and designing opportunities to relate spaces, resources, and communities.
In addition, the design of these spaces highlights the construction of, where the concept of long-term

resilience as said by Nadja Kabish et al. (2017) “should not only be considered to be beneficial for current and immediate pressures from climate change but also be able to withstand potential future changes [...], both environmental and socio-political changes. Long-term resilience thinking [...] is of particular importance because challenges from climate change will further impact on urban society during the upcoming decades and require long-term adaptation thinking.” (p. 325) .
Moreover, both the projects applied NBS strategies, together with a renewed community care of the ground, to design a new part of the urban landscape, structuring a renewed concept of longue durée, able to produce short-term relapses (especially on the community engagement) and a long-term regeneration, framed as one of the urgencies of contemporary cities.
What emerges from both the projects is the renewed centrality of the relationship between humans and nature, where the ground plays a focal role: within the impermeability and damaged soils of cities could represent the resource of the future urbanity, where act against climate change and design new public place of interaction.
In conclusion, investigating the usage of NBS and CE as resiliency approaches exposes how the relation between resources, people, and grounds can define a new design perspective sensible to the nowadays fragilities. Indeed, the closeness between inhabitants and grounds, and the necessity of a systemic regeneration among our cities, can relate to the inner metabolism of communities and lands, defining a possible long-term resiliency of the project and building the future scenario for our cities and societies.

Ground-works as possibility for the climate crisis adaptation

Given the above, one of the main contributions of this work is to open the discussion on design strategies that could be used to design and regenerate the urban ground. Specifically, the usage of Nature-based solutions envisions the possibility of reclaiming polluted soils and settling a renewed dialectic between urban minerality and nature. Moreover,

considering the unbalanced framework stated at the beginning of the article, considering the upheaves of climate change, it is crucial to rethink the design action toward a more resilient design process.

Concepts such as adaptation of urban space, mitigation of the climate effects, decarbonization of cities, etc., could directly impact the approach we have with designing the city's grounds. Moreover, the action of care could be completely integrated within the idea of the project, where the community activity creates a deep bond between people and space, generating a relationship between ground and commons.

Specifically, the two projects display how ground regeneration could embody social and common values, where the ground is an urban element to share, know, and care about. Furthermore, the collective use of these spaces can increase the ethical value of using Nature-based solutions in public spaces, influencing the adaptation of the urban landscape[11].

Consequently, this form of Nature-Based design can impact the ability of urban public areas to adapt the environment against the effects of climate change, linking it to a new design paradigm of urban ecology. Thus, nature could be not only an eco-technical instrument, but it deals with a new urban sensoriality[12] making a closer connection between the minerality of the city and the wilderness of nature.

Through critical analysis, an embedded value of these projects can be foreseen, where the implementation of an ecological attitude to the project helps in making closer relations between people and the environment. In addition, this could sensibilize society to the urgent issue of climate change, understanding the necessity of adaptation and giving the urban sphere a social role too.

In conclusion, nowadays, the design of ground(s) could relate to urgent issues, understanding which design

11. Robert Shaw, Michelle Colley, and Richenda Connell, *Climate Change Adaptation by Design: a Guide for Sustainable Communities* (London: Town and Country Planning Association, 2007).
12. Mirko Zardini, "Toward a Sensorial Urbanism". *Lotus* 157, (2015):63:73

tools to use, and how to foster the transition that we must display to face the current unbalanced condition of our cities. In this perspective, Nature-Based Solutions and Circular Economy represent key approaches to rethinking our relationship with nature toward a new culture of the ground.

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The Val di Sole Blueprint: Mapping Dynamics Assets for Sustainable Development of Marginal Territories in Alpine Context.

Fragile Landscapes; Water Ecosystems; Inner Territories; Dynamic Mapping; Branding4Resilience

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In Italy, the fragile territories addressed by the National Strategy on Inner Areas (SNAI), despite their geographical marginalization and demographic decline, are lately experiencing a growing momentum. Currently lacking successful policies for effective transformations, the adoption of a sustainable design-driven approach is necessary in order not to compromise the territorial resources of these areas with a spread “urbanized” strategy. The PRIN project “ B4R. Branding4Resilience” addresses such issue investigating marginal territories around the Italian peninsula and proposing territorial brands that promote resilience. This paper presents the first results of the University of Trento research unit after the preliminary phase of context exploration: according to a multi-disciplinary and multi-level approach, a data collecting process allowed to map the ecological, social, and spatial elements of the Val di

Sole pilot area. As a portrait map of the valley, the presented "blueprint" highlights the hydrological network, where springs and thermal waters are at the center of the blue infrastructure that has to be developed. Indeed, this digital cyanotype is an operative tool to support further co-design and co-visioning processes towards a territorial strategy based on the value of the water resources and focused on the implementation of thermal landscapes through spatial transformation.

Introduction

The current (post-)pandemic era has reactivated many reflections about the relation among natural and urban environments, with particular interest to marginal areas[1]. Small villages all over Italy–from the Alps to the Apennines and the islands–are spaces for re-habitation in new and different life and work models[2]. Indeed, these "inner areas", as defined by the National Strategy for Inner Areas (SNAI) (Fig. 1), are not

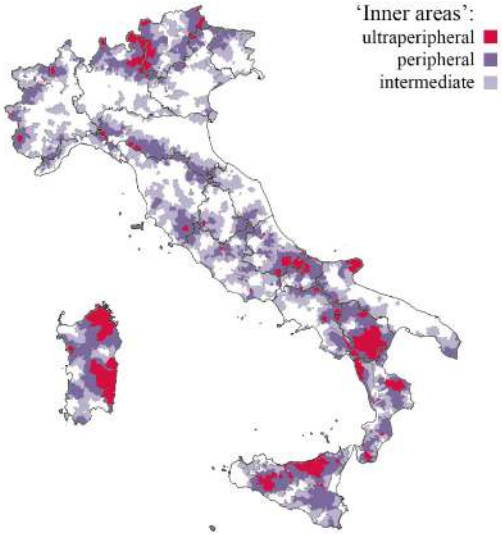

Fig. 01

Inner areas in Italy according to the SNAI. Credits: Coordination Sara Favargiotti, graphic elaboration Chiara Chioni, 2022

1. *Aree interne e covid*, ed. Nicolò Fenu (Siracusa: LetteraVentidue, 2020).
2. In *Riabitare l'Italia. Le aree interne tra abbandoni e riconquiste*, ed. Antonio De Rossi (Roma: Donzelli, 2018), the huge territorial capital made up of villages, agricultural and river systems, woods, and minor infrastructures was presented, waiting to be reinterpreted, reused, maintained, and renewed.

residual[3], but account for almost 53% of municipalities, 23% of the population and about 60% of the entire territory[4] and require a sensitive, respectful, and sustainable design-driven approach in order not to compromise their territorial resources. Economic, service, and infrastructure marginality have been the primary focus of studies and funding initiatives, with the classification of the inner areas based on quantitative indicators primarily aimed at assessing their "accessibility" to essential services[5]. However, the value of natural resources, contemporary interpretations of ancient land management processes, and innovative practices to care for landscape and building heritage in vulnerable contexts have yet to be fully explored and used as indicators of quality of life[6].

In this framework, the PRIN project, "B4R. Branding4Resilience"[7], aims to investigate the possibility of a new role of the peripheral contexts in relation to metropolitan areas, for a more balanced human-natural lifestyle. This applied research intervenes on four inner areas in Marche Region,

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3. The Italian Pavilion at the Biennale Architettura 2018, "Arcipelago It, curated by Mario Cucinella, chose these territories to represent the Italian identity.

4. Dipartimento per lo Sviluppo e la Coesione Economica (2013), *Strategia Nazionale per le Aree Interne: definizione, obiettivi, strumenti e governance. Accordo di partenariato 2014-2020*, Roma.

5. A similar classification criterion defined the "inner peripheries" of the European project PROFECY (ESPON, *PROFECY – Processes, Features and Cycles of Inner Peripheries in Europe*, 2017).

6. Blečić and Cecchini, to assess the fragility/opportunity, propose the reference to the concept of territorial capital based on a combination of human capital, social capital, cognitive capital, infrastructural capital, productive capital, relational capital, environmental capital, settlement capital. (Ivan Blečić, Arnaldo "Bibo" Cecchini, "Elogio della fragilità: città e territorio per l'epoca (post-) pandemica" in *Aree interne e covid* (Siracusa: LetteraVentidue, 2020), 264).

7. The research "B4R. Branding4Resilience. Tourist infrastructure as a tool to enhance small villages by drawing resilient communities and new open habitats" (project number 201735N7HP) is a research project of relevant national interest (PRIN 2017 - Young Line) funded by the Ministry of University and Research (MUR) (Italy) with a three-year duration (2020–2024). The project is coordinated by Prof. Maddalena Ferretti (Università Politecnica delle Marche), and it involves as partners the University of Palermo (local coordinator Prof. Barbara Lino), the University of Trento (local coordinator Prof. Sara Favargiotti) and the Politecnico di Torino (local coordinator Prof. Diana Rolando). For more information: www.branding4resilience.it.

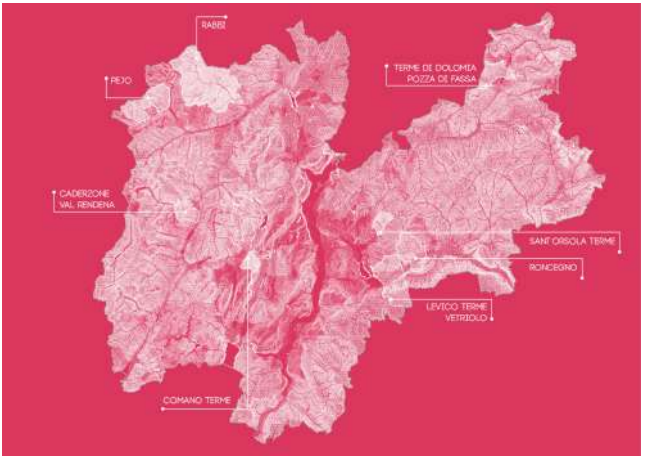

Fig. 02
Thermal system in Trento province. Credits: Coordination Sara Favargiotti, graphic elaboration Margherita Pasquali, 2020.

Trento Province, Piedmont, and Sicily to design tourist infrastructures in selected small villages (i.e., focus areas) as agents of a larger transformation path, towards resilient communities and new open habitats. The ongoing project is structured in three main stages: (i) an exploration phase, to identify and describe the contexts involved with a focus on spatial interactions; (ii) a co-design operative phase, and (iii) a co-visioning phase, both involving local actors and communities. Expected results of these phases are an atlas, exploring and mapping the contexts, a web-based collaborative platform, enabling tailored experiences, and a roadmap, drawing and guiding strategic scenarios towards resilient communities and habitats[8].

This paper aims to present and discuss the first results achieved in the exploratory phase by the University of Trento research unit, which pursues leadership in innovating with nature through locally

8. Maddalena Ferretti, Sara Favargiotti, Barbara Lino, Diana Rolando, "B4R Branding4Resilience. Tourist infrastructure as a tool to enhance small villages by drawing resilient communities and new open habitats" in *Atti della XXIII Conferenza Nazionale SIU. DOWNSCALING, RIGHTSIZING. Contrazione demografica e riorganizzazione spaziale* (Roma-Milano: Planum Publisher, 2021), 346-354.
Maddalena Ferretti, Sara Favargiotti, Barbara Lino, Diana Rolando, Branding4Resilience. Explorative and Collaborative Approaches for Inner Territories. Sustainability 2022, 14, 11235. https://doi.org/10.3390/su141811235.

implementable actions in small thermal villages (Fig. 2), specifically focusing on the Val di Sole pilot area[9]. The goal is to develop a territorial strategy based on the value of water resources, by encouraging the enhancement of the territorial capital through spatial transformation. The development of nature-based activities, focused on creating healthier living habitat, is promoted in relation to blue and green infrastructures[10]: the first one corresponds to the hydrological network, where springs and thermal waters are at the center of the enhancement process; the second one is the environmental system that connects the natural resources and the ecological paths.

Methodology

The general methodology developed for the exploration phase is common for all the research units of the B4R project and is structured using an open matrix that allows critical reading and methodological validation. The construction of this matrix started from the analysis of contexts up to their interpretation, based on the definition and sharing of four key concepts: resilience, vulnerability/vibrancy, local identity, and place-making.
In particular, the B4R definition of resilience must guide and verify the exploration phase, which consists in the actions of reading and knowing, interpreting, and selecting the focus areas. This first phase develops through mapping and analysis processes based on reworking and extraction of data, categorizing and grouping them within four macro dimensions: “infrastructure, landscape, and ecosystems”, “built and cultural heritage, and settlements dynamics”, “economies and values”, and “networks and services, community and governance models”. Moreover, numerous sub-themes are defined to thematize and visualize the data in cross maps.

9. Sara Favargiotti, Margherita Pasquali, Chiara Chioni, Angelica Pianegonda, Water Resources and Health Tourism in Val di Sole: Key Elements for Innovating with Nature in the Italian Inner Territories. Sustainability 2022, 14(18), 11294. https://doi.org/10.3390/su141811294.
10. Maria Beatrice Andreucci, *Progettare Green Infrastructure* (Milano: Wolters Kluwer Italia, 2017).

These maps are the result of the collection, analysis, and interpretation of the same categories of data for the four focus areas, simplifying their reading and transversal comparison. Finally, a summary portrait-map identifies the peculiarities of each area towards the creation of a territorial brand.

In this framework, the University of Trento research unit has specifically contributed to define the sub-themes and parameters for the "infrastructure, landscape, and ecosystems" macro dimension, since both the Trento Province and the Val di Sole pilot area are characterized by an important presence of natural capital[11]. The authors propose an interdisciplinary approachthat combines landscape ecology, territorial metabolism, mapping, and spatial data to comprehend the dynamics of marginal territories. An in-depth data collecting process is conducted to explore the natural identity of the Val di Sole (Fig. 3).

The mapping process is used as a tool for the spatial representation of the experience acquired in the pilot area[12]: the qualitative and quantitative data collected are spatialized, mapped and reworked in a series of maps and finally in the synthetic Val di Sole blueprint, presented in the following sections. The landscape heritage (i.e., water resources, agricultural systems, forests, natural and human landscapes) is the object and the objective of the mapping action to store and transmit knowledge about the environmental resources of the territory. The main steps are: (i) data collection and structure from multiple sources (Fig. 4); (ii) thematic maps creation, focusing on the hydrological resource in relation with the small villages[13]; (iii) actual resources and potential values identification; (iv) portrait map creation, enlightening the natural identity of the Val di Sole.

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11. Comitato per il Capitale Naturale, *Capitale naturale: la nostra eredità. Quarto Rapporto sullo Stato del Capitale Naturale in Italia. Sintesi* (2021).
12. See James Corner, "The Agency of Mapping: Speculation, Critique and Invention" in *Mappings*, ed. Denis E. Cosgrove (London: Reaktion Books, 1999), 213-252: "[...] the map always precedes the territory, in that space only becomes territory through acts of bounding and making visible, which are primary functions of mapping."
13. In computing, the first two steps are known as a unique phase called "Extract, Transform, and Load (ETL)".

Fig. 03

Natural and human landscapes in Rabbi (top) and Peio (bottom) (TN). Credits: Veronique Panciera (top, left), Chiara Timpone (top, right), 2020 and Chiara Chioni (bottom), 2021

Fig. 04

Multiscale and multilevel open data sources for the Val di Sole. Credits: Coordination Sara Favargiotti, graphic elaboration Chiara Chioni, 2021.

Results of the exploratory phase: a first atlas

The Val di Sole inner area comprehends 13 municipalities and extends for about 611 km². Because the territory is mostly mountainous, the 15,600 inhabitants (ISTAT, 2020) are concentrated in the main centers on the valley floor and in the side valleys of Peio and Rabbi. The strategic project, drawn up from the Trento Province based on the SNAI and updated on February 2020[14], presents an overview of the actual conditions and the evolutionary trends of the valley to define a desired future scenario of sustainable development. The first twenty-one maps, elaborated from the University of Trento research unit and composing the work-in-progress atlas, spatialize such conditions and trends allowing the reading and the

14. Provincia Autonoma di Trento, *Strategia Nazionale delle Aree interne. Progetto strategico della valle di Sole* (vers. 4.0, February 2020).

interpretation of the relationships between ongoing phenomenon and their physical imprint on the territory.

The “natural and landscape heritage” map (Fig. 5) identifies the presence of high natural capital– nearly half the territory is subject to protection and preservation measures – with a limited spread of built-up areas coinciding with the ancient areas of anthropization of the mountains.

The “geomorphological and hydrographic character” map (Fig. 6) highlights the massive presence of water and blue infrastructure systems. Rivers, lakes, glaciers, springs, and thermal waters are the most valuable resources as well as the generators of local cultural and economic values (e.g., hydroelectric centrals, mineral water bottling plant, thermal and wellness centers).

The “natural risks” map (Fig. 7) shows a fragile land characterized by a medium hydrogeologic (flooding, avalanche, landslide, storm) level of risk to be addressed through landscape planning, design, maintenance, and care actions.

The “infrastructure network and mobility” map (Fig. 8) identifies the only main route that crosses the valley, connecting it to the nearby Lombardy region (on the West) and to the other valleys of Trento Province (on the East). The side valleys of Peio and Rabbi are dead-end systems for vehicles, aggravating the marginality of the upper Val di Sole. This status of fast mobility generates inconveniences especially during peak tourist periods (winter and summer). On the other hand, a widespread pathway of slow mobility (e.g., bike paths, trails, mountain routes) covers the territory and can be the driving force to promote sustainable tourism flows. The “dynamism of the tertiary sector” map (Fig. 9) identifies tourism as the leading economic sector, stable in employment and with positive prospects for the future. Indeed, the provincial strategic project for the Val di Sole states that the driving force for the future development of the territory will be tourism, as it has been for the last fifty years: the medium to long term perspective is to invest in strengthening the quality of tourist services and the seasonal adjustment of demand (i.e., by promoting local resources to diversify the offer with respect to winter sports).

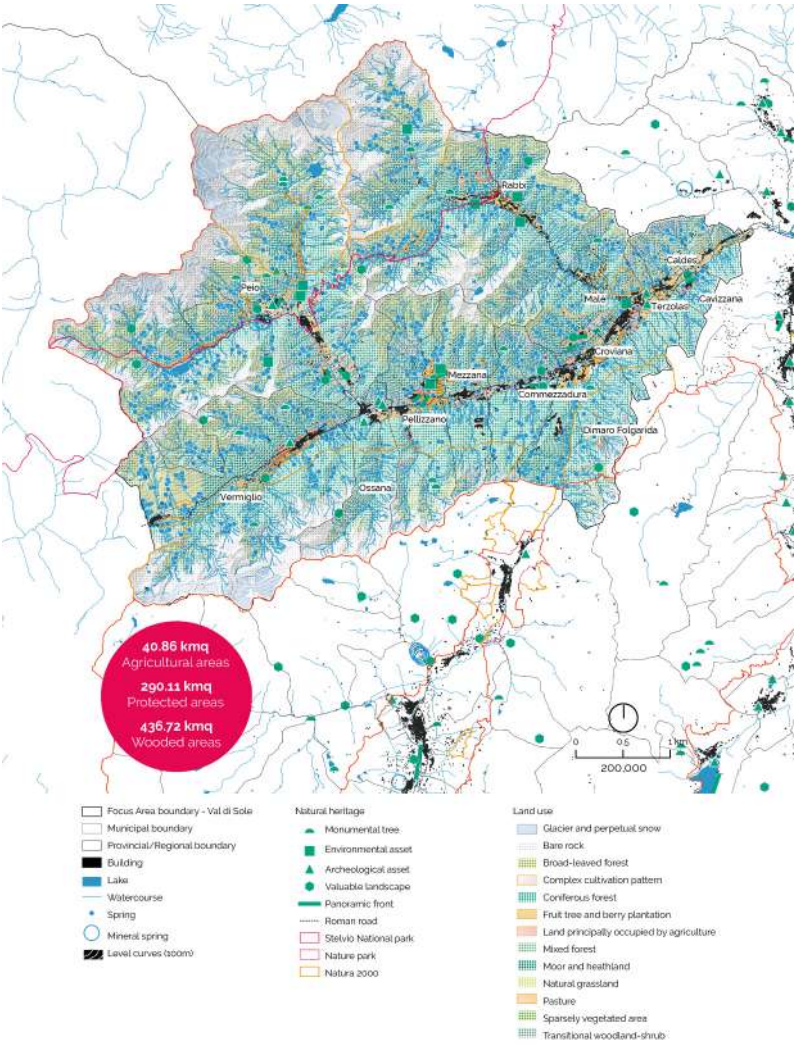

Fig. 05

"Natural and landscape heritage" map[15].
Credits: Coordination Sara Favargiotti,
graphic elaboration Chiara Chioni and
Margherita Pasquali. ©Branding4Resilience–
UNITN, 2020-2024.

15. Data sources: ISTAT (2019, 2020), CTP (2017), "TINITALY" DEM (2007), CORINE Land Cover (2018), Geoportale Nazionale (2017), PUP (2019), GeoCatalogo PAT (2010, 2018, 2019).

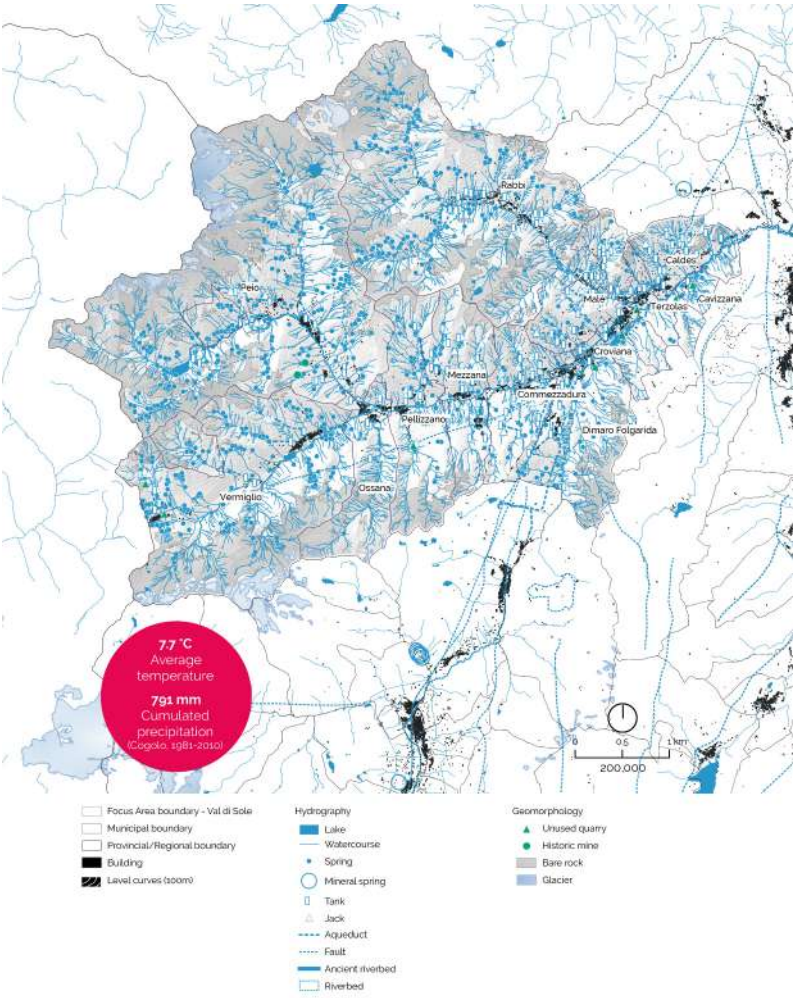

Fig. 06

"Geomorphological and hydrographic character" map[16]. Credits: Coordination Sara Favargiotti, graphic elaboration Chiara Chioni and Margherita Pasquali. ©Branding4Resilience–UNITN, 2020-2024.

16. Data sources: ISTAT (2020), CTP (2017), "TINITALY" DEM (2007), CORINE Land Cover (2018), PUP (2019), Protezione Civile (2018), ISPRA (2014).

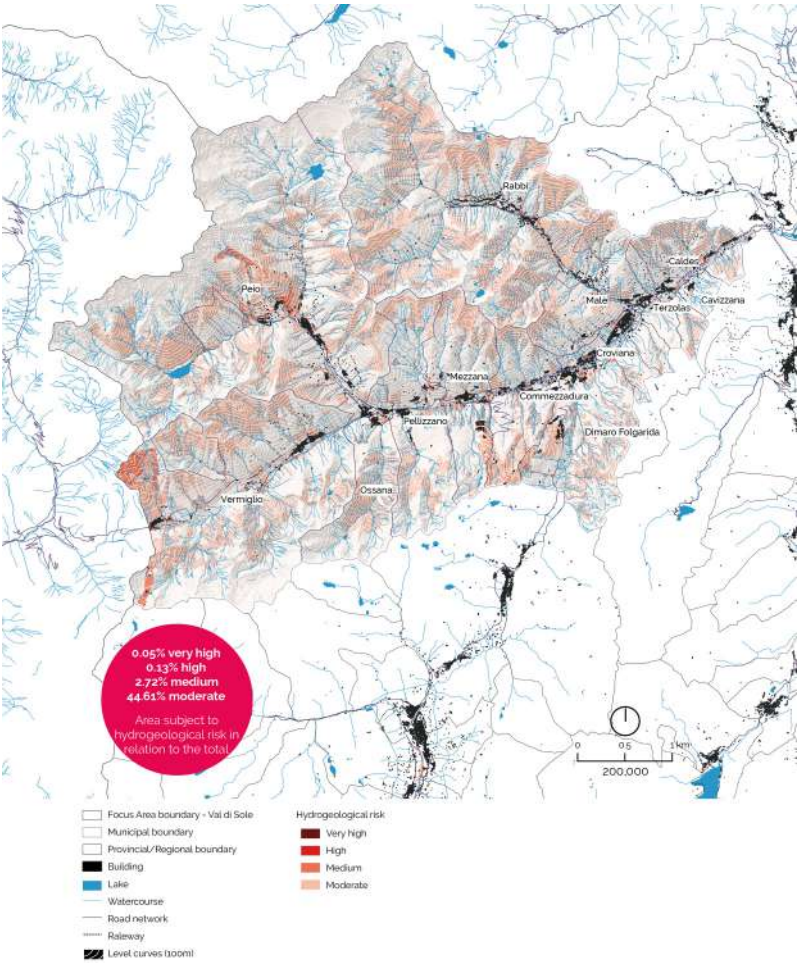

Fig. 07

"Natural risks" map[17].
Credits: Coordination Sara Favargiotti, graphic elaboration Chiara Chioni and Margherita Pasquali. ©Branding4Resilience–UNITN, 2020-2024.

17. Data sources: ISTAT (2020), CTP (2017), "TINITALY" DEM (2007), Servizio Gestione Strade PAT (2020), PUP (2019), Geoportale Nazionale (2013).

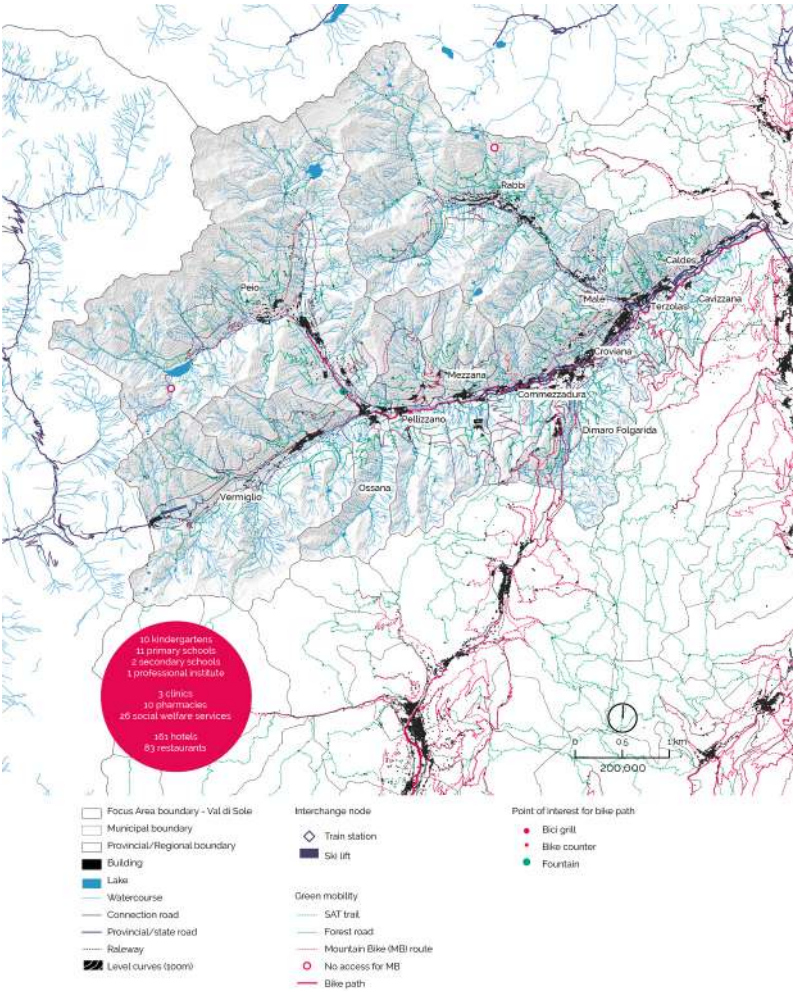

Fig. 08

"Infrastructure network and mobility" map[18]. Credits: Coordination Sara Favargiotti, graphic elaboration Chiara Chioni and Margherita Pasquali. ©Branding4Resilience–UNITN, 2020-2024.

18. Data sources: ISTAT (2020), CTP (2017), "TINITALY" DEM (2007), PUP (2019), Servizio Gestione Strade PAT (2020), GeoCatalogo PAT (2008, 2013, 2019, 2021), OPENdata Trentino (2013), Azienda per il turismo delle Valli di Sole, Peio e Rabbi SCPA (2021), Vivoscuola (2021), Azienda Provinciale per i Servizi Sanitari PAT (2021), OpenStreetMap (2021).

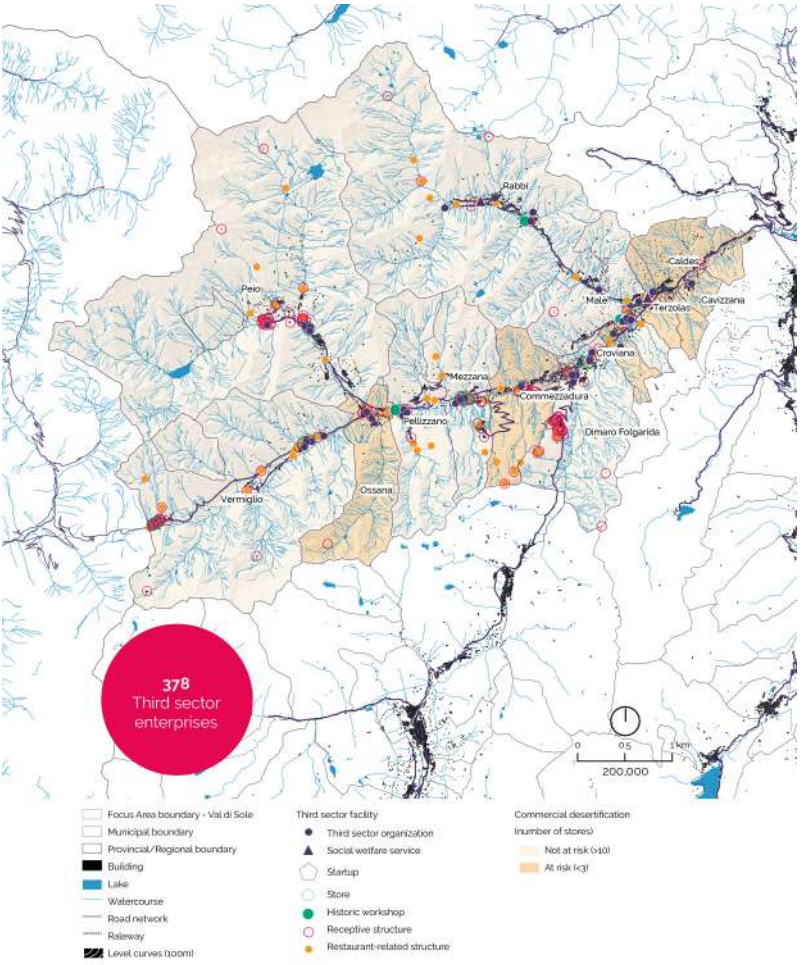

Fig. 09

"Dynamism of the tertiary sector" map[19].
Credits: Coordination Sara Favargiotti,
graphic elaboration Chiara Chioni and
Margherita Pasquali. ©Branding4Resilience–
UNITN, 2020-2024.

19. Data sources: ISTAT (2020), CTP (2017), "TINITALY" DEM (2007), PUP (2019), Servizio Gestione Strade PAT (2020), OPENdata TRENTINO (2019, 2020), OpenStreetMap (2021), GeoCatalogo PAT (2013, 2016, 2021), Trentinosociale.it (2021), Azienda per il turismo delle Valli di Sole, Peio e Rabbi SCPA (2021).

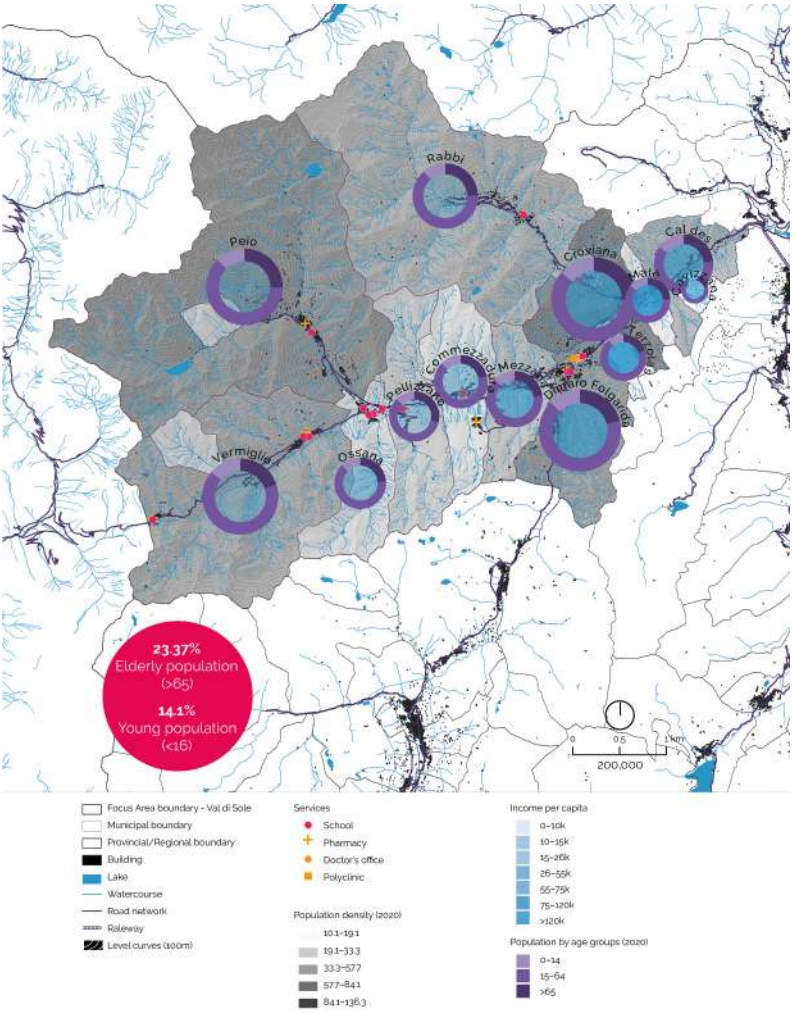

Fig. 10

"Communities and fragility" map[20]. Credits: Coordination Sara Favargiotti, graphic elaboration Chiara Chioni and Margherita Pasquali. ©Branding4Resilience–UNITN, 2020-2024.

20. Data sources: ISTAT (2018, 2020), CTP (2017), "TINITALY" DEM (2007), PUP (2019), Servizio Gestione Strade PAT (2020), Azienda Provinciale per i Servizi Sanitari (2021), Vivoscuola (2021), OpenStreetMap (2021).

The “communities and fragility” map (Fig. 10) shows the aging of the population, particularly those living in the more marginal areas of the valley and less dynamic from an economic point of view. This situation poses problems in terms of care, mobility, and abandonment of the territory: centuries of interaction have produced a fragile but fascinating balance in which the alpine territory needs man and man needs the territory.

The portrait map: Val di Sole blueprint

Each B4R research unit, after the preliminary mapping phase, made the effort to represent the selected territories through a synthesis map which highlights their hidden and unexplored potential. In the case of Val di Sole, the thermal landscape and the hydrological resource mainly represent the territory’s natural capital and, therefore, its portrait map is a “blueprint”, intended in its extended meaning of tool to drive scenarios.
Indeed, in addition to its technical meaning of “drawing”, referring to white lines on a blue background especially used in the architecture, engineering and construction, the term blueprint means a preliminary plan for future achievements. Critically summarizing the water potential, the Val di Sole blueprint uses the same graphic semiology[21] of the technical drawings: the hydrographic network of the territory, enhanced by watersheds and water flows, leaves a white imprint on the blue ground, defining by subtraction the valley geography. The focus area thus appears as an island in a larger archipelago in which the topography becomes the bathymetry (Fig. 11). In particular, the blueprint highlights the two thermal resorts in the small villages of Peio and Rabbi as attractive poles of the blue infrastructure system[22]. Making visible the invisible connections, this map relates the settlements producing and using water and thermal resources to the hydrography of the territory. This interpretation suggests the delineation of

21. Jacques Bertin, *Semiology of Graphics: Diagrams, Networks, Maps* (Madison: The University of Wisconsin Press, 1983).
22. Elena Dai Pra. *Geografie del benessere. La riqualificazione ecosostenibile del comparto termale e paratermale in Trentino* (Milano: Franco Angeli, 2013).

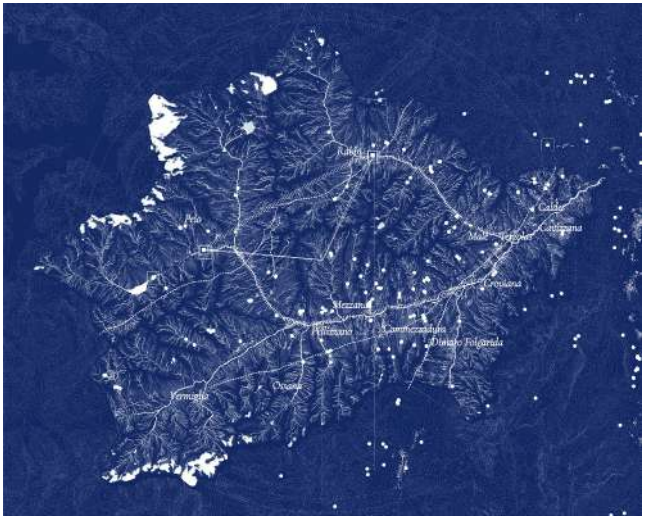

Fig. 11

The Val di Sole blueprint. Credits: Coordination Sara Favargiotti, graphic elaboration Margherita Pasquali. ©Branding4Resilience–UNITN, 2020-2024.

Fig.12

New routes in Val di Sole. Credits: Coordination Sara Favargiotti, graphic elaboration Margherita Pasquali. ©Branding4Resilience–UNITN, 2020-2024.

unknown routes towards the development of a new network that enhances the natural capital of the area (Fig. 12)[23].
Finally, the aim of the blueprint is to offer an operative tool to analyze and interpret the territory, towards landscape and architectural design actions. Reading the fragility/opportunity of the area establishes a new "territory of possibilities"[24] on which to act with a resilient strategy that must respond also to the need for a new economic model, not related only to the tourism sector[25].

Conclusion and future developments

The B4R research approach proposes a re-generative and adaptive territorial brand promoting resilience: its transformation processes and subsequent benefits are to be assessed by including community to preserve the local identity and – for the University of Trento's focus area – to renew the wellbeing tourist offer.
An interdisciplinary and multiscale methodology, combining qualitative and quantitative approaches, has been adopted to collect data and explore the natural identity of the Val di Sole, contemplating both ecological and spatial elements (i.e., physical and immaterial qualities, weaknesses and needs of local communities).
The creation of an atlas of thematic maps allows to visualize the complexity and the dynamism of the territory, supporting the development of a territorial brand. The effective usage of the maps to support participative planning actions would be directly assessed by experts and citizens during workshops, seminars, and meetings in the following B4R project phases. Starting from the synthetical, recognizable

23. Margherita Pasquali, Chiara Chioni, Sara Favargiotti, "Soaking in the thermal landscapes: A Slow Tour Across the Italian Inner Territories". *Ri-Vista* 2022, 20, 222–237.
24. Giuseppe Dematteis. *Le metafore della terra. La geografia umana tra mito e scienza* (Milano: Feltrinelli, 1985).
25. Leonardo Becchetti, full professor of Political Economy at the University of Rome Tor Vergata, in his intervention at the *Green Week* in Trento (February 26 - March 3, 2019) proposed a "hybrid economic system, therefore civil".

and brandable image of the Val di Sole blueprint, it will be easier for the involved stakeholders to read the exploration phase, interpret the concepts developed by the research and directly participate in the planning of their territory.

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Ferretti, Maddalena, Favargiotti, Sara, Lino, Barbara, Rolando, Diana. “Branding4Resilience. Explorative and Collaborative Approaches for Inner Territories”. *Sustainability* 14 (2022):11235.

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Habitats Portraits. Trans-scalar Mapping as an Exploratory Tool to Unveil the Dynamics of Inner Areas in Marche Region.

Exploration; Portrait map; Marginalization; Dynamics; Reserves of resilience

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The present contribution, part of the author's doctoral research[1], aims to present the tool of trans-scalar mapping as an innovative way to explore and unveil habitat's dynamics. The specific contexts of investigation are the Marche region, the Appennino Basso Pesarese-Anconetano and some of its villages. Habitats' portraits are intended as a tool to attempt a process of synthesis and a description of the territory through the eyes of the planner to bring out the positive and critical aspects of it. The trans-scalar process of investigation and mapping led to consider the exploration of these living systems as an integrated reading, structuring it through a holistic

1. *Designing Resilience: Trans-scalar Architecture for Marginal Habitats of Marche Region* is the author's PhD research (2022), carried out between the Department of Civil, Building Engineering and Architecture of Marche Polytechnic University and the Faculty of Architecture and Landscape Sciences of Leibniz Universität Hannover (Germany) under the supervision of Prof. Arch. G. Mondaini (UnivPM), Prof. Arch. M. Ferretti (UnivPM) and Prof. DiplIng. Univ. J. Schröder (LUH).

approach. This latter emphasizes the concept of interconnection, proposing continuous jumps between causes and effects, which generate new knowledge and interpretations.

Mapping habitats

Maps are among the most effective wayfinding aids, making sense of the space around us, supporting spatial navigation and perception, and, more broadly, changing the way in which the world is seen. As visual representations, they often constitute the most tangible medium of interaction across different cultures, spaces and actors[2].
Habitats, as living settlements, are highly complex systems that include within them a variety of further sub-systems. This term refers not only to the natural environment, but also to the built and productive ones, and the communities that inhabit them, and to the intangible aspects, such as relationships, traditions, values, atmospheres, etc. Moreover, they are always subject to various modifications -intended or not- so they are dynamic and in transformation. The habitat portraits are intended as a tool to attempt a process of synthesis and a description of the territory through the eyes of the planner to bring out the positive and critical aspects of it. These standpoints led to consider the exploration of the inner areas of the Marche Region as an integrated reading, structuring it through a holistic approach. This latter intends the system as an interconnected whole that is part of a larger world, requiring the incorporation of all aspects of the ecosystem – tangibles and intangibles – and the interpretation of them in their reciprocity.

Methodologies

The spatial mapping of the inner areas of the Marche Region has been based on an exploration phase, carried out through a combination of quantitative and qualitative analyses. First, the collection of data that

2. Ignaccolo, Carmelo. “Mapping Practices for a Cosmopolitan World”, in *Cosmopolitan Habitat*, edited by Jörg Schröder, Maurizio Carta, Federica Scaffidi, Annalisa Contato. (Berlin: JOVIS Verlag GmbH, 2021).

refer to environmental, settlement, economic and demographic characteristics allowed an initial investigation into the actual situation and the transformative dynamics of the area. On-field research was certainly the main tool to deepen and widen the knowledge already achieved, especially of the natural and built environment, through a systemic photographic campaign, and of the relationships between local actors and existing opportunities, through semi-structured interviews to selected stakeholders. This made it possible to have a perspective of the context directly from those who live in and know these places. Also, the design has been used as an exploratory tool to better grasp the resources, metabolisms, atmospheres, and identity of the places (Figure 01).

Starting from the indicators present in the 'Guida agli indicatori della diagnosi aperta della Strategia per le aree interne' (2014) further ones have been added and combined through the shared work of all the Branding4Resilience[3] research units. Thus, traditional indicators such as demographic aspects, economic activities, cultural and tourist heritage, health, accessibility, education and associationism between municipalities have been combined with data on the

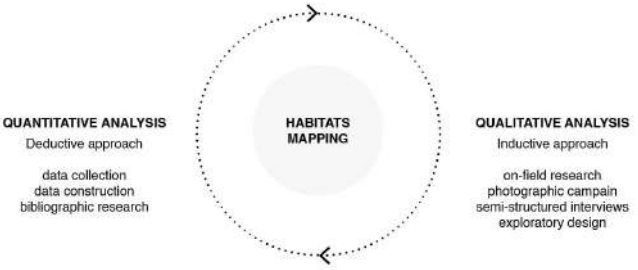


Fig. 01

Methodologies of investigation of the Marche's inner areas. Credits: Maria Giada Di Baldassarre.

3. "B4R Branding4Resilience. Tourist infrastructure as a tool to enhance small villages by drawing resilient communities and new open habitats" (2020–2023) is a research project of national interest (PRIN 2017 - Young Line) funded by the Italian Ministry of Education, University and Research (MIUR) coordinated by the Università Politecnica delle Marche (P.I. Maddalena Ferretti) and developed with the following research partners: the University of Palermo (Local Coordinator Barbara Lino), the University of Trento (Local Coordinator Sara Favargiotti) and the Polytechnic of Turin (Local Coordinator Diana Rolando). The project investigates the potential of territorial branding in drawing the resilient development of territories and communities in four Italian inner areas. Further info about the project can be found at: www.branding4resilience.it

landscape, in its natural and anthropic characteristics, tangible and intangible infrastructures, built heritage, risks and values, planning dynamics, development strategies, social fragility and innovation, the history and evolutionary trends of habitats and the communities that inhabit them. The main aim has been to comprehensively analyze the information, to obtain higher-level geographic information and strike to a new type of investigation: a more inclusive, open, and multidisciplinary.

The choice of making maps through the Open-Source software QGIS for geospatial information management is due to the necessity to represent geophysical of quantifiable data in a dynamic, interactive, and variable way, and made them transferable and usable to the municipalities. The GIS process includes collection, management, analysis, editing and output of information. In particular, the database was produced from the collection of data from national, regional, provincial and municipal portals, with priority given to the most recent possible data and the data with the highest definition and accuracy (Figure 02). Several elements were entirely constructed by the research unit from bibliographic research, tabular data, raster images, both historical and satellite, surveys in the area and interviews with local actors, thus representing a completely new source of knowledge of the area.

Trans-scalar Atlas for Marche inner areas

The relations between human systems at the various scales are not linear, but highly complex and variable, as self-organizing systems operate on a range of different scales of space and time. Trans-scalarity is a methodology that considers this interdependence between living systems of different scales, recognizing within the analyzed system a series of further sub-

Fig. 02

Overview of the national, regional, provincial and municipal portals used to create the database.
Credits: Maria Giada Di Baldassarre

systems interdependent on each other and on the system itself, approaching them in a holistic way. So, the trans-scalar mapping, moving between regional and local scales, explores the Marche Region and its inner areas, in particular the Appennino Basso Pesarese-Anconetano - pilot inner area of Marche Region within the National Strategy for Inner Areas (SNAI, 2014-20)- and some of its historic villages (Figure 03).

The investigation of these habitats moves through specific characteristics of human settlements (territorial morphology and landscapes, hydrographic and infrastructural systems, productive activities and economies, services and communities), trying to understand their risks and values, with a focus on what are the dynamics and transformations taking place. The latter are declined in different ways according to the scale: peripherality of the inner areas, abandonment of the Appennino Basso Pesarese-Anconetano and disused or degraded spaces of the villages.

The portraits of the Marche Region (Figure 4), at a very large scale, are essential to understand the causes of the peripherality of inner areas respectively to the territory that surrounds them. The region stretches from the mountainous landscapes of the Umbro-Marchigiano Apennines to the Adriatic Sea, through a 'comb structure' characterized by transversal infrastructural and ecological axes, where rivers[4] flow that originate from the countless water sources on the mountains and spread through numerous streams and brooks. The urban centres are concentrated along the coast and close to the rivers and infrastructural systems, while the mountain areas present a peculiar fragmentation of rural villages immersed in a system of reserves and natural parks of inestimable value. To highlight this duality is also the infrastructural system that allows fast mobility only along the coast, through the coexistence of the railway and the A14 Adriatic highway, while the connection with the Appennines is possible only through three railway's corridors, or

4. Marche Region's rivers from the north to the south: Foglia, Metauro, Cesano, Misa, Esino, Musone, Potenza, Chienti, Tenna, Aso, Tronto.

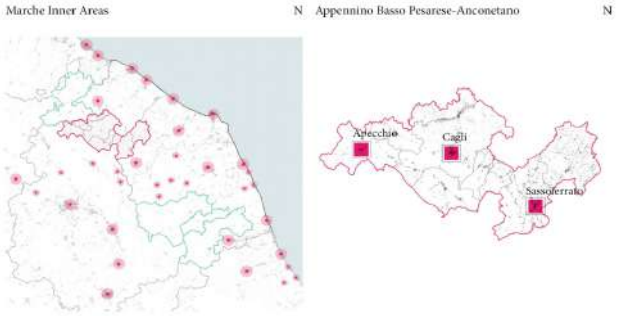


Fig. 03

Overview of the investigated areas: Marche's inner areas, Appennino Basso-Pesarese Anconetano, villages of Cagli, Sassoferrato and Apecchio. Credits: Maria Giada Di Baldassarre.

along national roads.
The Marche Region, alternating productive valleys and reliefs covered with traces of rural settlements, registers a large part of the territory in agricultural use. Regional productions, such as wine with Protected Designation of Origin (PDO) or agri-food products with Protected Geographical Indication (PGI), are the basis for the development of quality economic flows.
These are also connected to tourist itineraries, which ensure seasonal tourism, and to networks of municipalities[5] able to enhance territorial quality and reinforce their governance model and project strategies. Besides this, the Marche Region has a strong and diversified industrial inclination. The productive systems of small and medium-sized enterprises, specialized in certain fields and related by a common historical, social and economic experience, form the industrial districts which are actual historical-identity systems of the territory. These define specifically areas of textiles, mechanics, footwear, and furniture.
Differently from the other Italian contexts, the fragility of the Marche Region is amplified by the seismic and hydrogeological risks typical of the central Apennines. The seismic risk became evident with the events that occurred between 2016 and 2017 in the south between the provinces of Ascoli Piceno and Macerata. The

5. Presidi Slow Food, Città del vino, Città del tartufo, Città della birra, Città del miele, Città del pane, Città dell'olio, Città dei liquori.

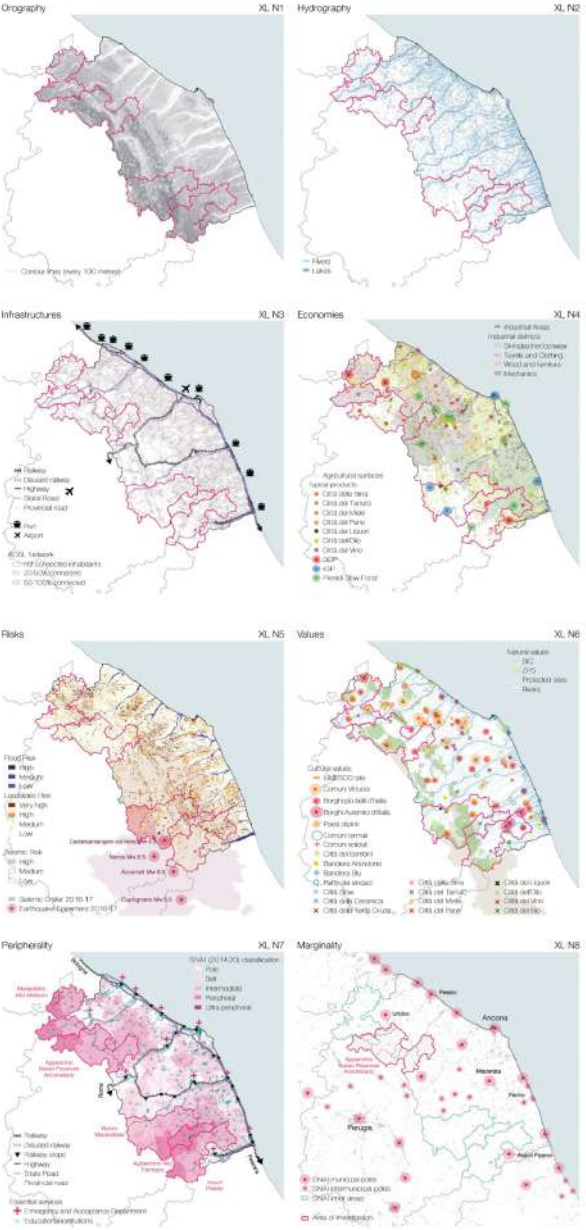


Fig. 04

Overview of Marche's regional maps, highlighting the inner areas. Credits: Maria Giada Di Baldassarre.

earthquakes destroyed entire historic centres of inestimable value, devastating local communities, and causing enormous historical and cultural loss. On the other hand, the hydrogeological risk, has prevalent effects on the environment, presenting itself through landslides, which deteriorate ecosystems and biodiversity. In these circumstances of social and spatial inequalities, it is easy to record negative demographic processes such as social exclusion, population ageing or out-migration, which are reflected on the settlements through abandonment and widespread degradation. The physical isolation of this peripheral areas from metropolitan development logics and processes has preserved some intrinsic values of their settlements, communities, landscape and identity, which can constitute a valuable reserve of resilience for their future development (Carta, 2017).
The Marche Region, as described by Piovene, is plural, since it possesses an extraordinary cultural variety generated by the morphological conformation of the territory and as a result of human activities. In the Appennines the settlement structure is polarized in rural-mountain villages, many of which are part of network that recognize their uniqueness in terms of heritage, sustainability, and values, and enhance their conservation and re-vitalization[6]. In addition, the region is rich in natural areas of important ecological and landscape value and high biodiversity. This has led to the recognition of several regional and national parks and reserves, with the need to establish Special Protection Areas (ZPS) and Sites of Community Importance (SIC)[7].
In the Marche Region five inner areas have been

6. 'Borghi più belli d'Italia', 'Comuni solidali', 'Città dei bambini', 'Città della ceramica', 'Città della terra cruda', 'Comuni virtuosi', 'Borghi Autentici d'Italia', 'Comuni termali', 'Paesi bandiera arancione', 'Patto dei sindaci', Bandiera blu', 'Città slow', 'Paesi dipinti' and UNESCO sites.
7. Parco Nazionale dei Monti Sibilli', 'Parco Nazionale del Gran Sasso e Monti della Laga', 'Parco Naturale Regionale del Conero', ''Parco Naturale Regionale del Monte San Bartolo', 'Parco Naturale Interregionale del Sasso Simone e Simoncello', 'Parco Naturale Regionale della Gola della Rossa e di Frasassi', 'Riserva Naturale Statale Montagna di Torricchio', 'Riserva Naturale Statale Abbadia di Fiastra', 'Riserva Naturale Statale Gola del Furlo', 'Riserva Naturale Regionale Ripa Bianca', 'Riserva Naturale Regionale Sentina', 'Riserva Naturale Regionale del Monte San Vicino e Monte Canfaito', 'Riserva Naturale del Bosco di Tecchie'.

identified: Appennino Basso Pesarese-Anconetano, Ascoli Piceno, Nuovo Maceratese, Montefeltro and Alto Metauro, Appennino Alto Fermano. Not surprisingly, these are all located in the pre-Apennine area, as a backbone of the ecological, infrastructural, and productive systems of the valleys. Comprising sixty-eight municipalities, covering an area of about 3500 km² and having 122.173 residents, with an average population density of about 35.15 inhabitants/km² compared to the regional average of 160.90 in/km² (Istat, 2019), these areas are defined mainly as intermediate-peripheral ones (SNAI). The reduced accessibility, the lack of educational and health care offer, are the primary cause of the historical underdevelopment, weak and vulnerable territorial economy, and lack of job opportunities.

The portraits of the Appennino Basso Pesarese-Anconetano (Figure 05), at a territorial scale, allow to analyze and understand the existing relationships at a supra-municipal level, which is the one addressed by the SNAI. Its territory straddles the provinces of Pesaro-Urbino and Ancona and is close to the municipal centers of Urbino and Fabriano. It turns out to be composed of nine municipalities (Acqualagna, Apecchio, Arcevia, Cagli, Cantiano, Frontone, Piobbico, Sassoferrato and Serra Sant'Abbondio), covering 846.13 km² and counting 32.375 residents, with an average population density of 39.79 in/km² (Istat, 2019). The area develops along rivers from the valley to the Catria and Nerone mountains. From the infrastructural point of view, the area is tangentially touched to the south by the Ancona-Rome railway line and is crossed by the Fabriano-Urbino-Pesaro one, abandoned since 1943. Inside the area, mobility mostly occurs through municipal roads or through bicycle and pedestrian routes, including hiking.

The economic underdevelopment highlights a stagnation in the three primary sectors, with backwardness especially in the tertiary one. One third of the total surface is at agricultural destination, pointing out the marked agricultural vocation of the area. Despite the farms are spread throughout the territory, the trend of dynamism in the last decade has recorded a decrease of almost 25%. Regarding the mining activity, there are 164 quarries, of which only 12 are active, where materials are extracted especially for

industrial use (sand, gravel and stratified limestone),ornamental use or construction use (limestone).
The area is part of a seismogenic zone with an indeterminate fault mechanism and subject to important seismic accelerations on the ground. The hazard increases in proximity to the Umbrian border. To the seismic risk is also associated the hydrogeological risk referred to floods and landslides. The Municipality of Arcevia is also the only one to have areas at high risk of desertification. Beside these risks, the area embedded high values. In the territory there are extended protected areas, including three national parks[8] and landscape assets of value (Gola del Furlo). On a cultural level, the area is included by two historical roads: the Roman via Flaminia to the north and the consular road Clementina to the south. There are also several archaeological parks, monuments, historical residences, theaters, mills, churches, and museums, put into system through the many cultural itineraries[9] and a varied program of cultural events that in the summer are able to attract tourists from all over the world with a population increase of more than 30% (Istat, 2019). Fundamental elements to emphasize are the experiences of innovation (Fab-lab, artistic residences, co-housing, co-working) and the presence of social innovators, mostly young people, trained through mixed experiences between profit and nonprofit, that provide new solutions related to the territory and traditions and with positive effects for the entire community. The networks of municipal associations[10] and the presence of social innovators have the potentiality to enhance territorial quality and strengthen their governance model and the project

8. 'Parco Naturale Regionale della Gola della Rossa e di Frasassi', 'Riserva Naturale Statale Gola del Furlo' and 'Bosco di Tecchie'.
9. Cultural itineraries in the area: 'Itinerario ducale Montefeltro e Della Rovere', ' Itinerario dei Castelli di Arcevia', 'Itinerario culturale di Cagli', 'Itinerario culturale di Acqualagna'.
10. National and international municipal networks in the area: 'Patto dei Sindaci', 'Comuni Virtuosi', 'Città SLOW', 'Bandiere Arancioni', 'Borghi più belli d'Italia', 'Città del Tartufo', 'Città del Pane' and 'Città della Birra'.
11. 'Unione Montana Catria e Nerone' formed by Cagli, Cantiano, Apecchio, Acqualagna, Frontone and Serra Sant'Abbondio, instead 'Unione Montana Esino Frasassi' includes Sassoferrato.
12. 'GAL Montefeltro' includes Cagli, Cantiano, Piobbico, Apecchio, Acqualagna, 'GAL Flaminia Cesano' Frontone and Serra Sant'Abbondio, 'GAL Colli Esini' Sassoferrato and Arcevia.

strategies already in place. Both at a national (SNAI) and local level, the area is the object of various strategies and dynamics of transformation. Operating in the area are the Mountain Unions[11] and the Local Action Groups (GAL)[12]. Among the most relevant ongoing initiatives and strategies there are the SNAI and the Marche Region Cycle Route (2020). The cultural projects carried out within the Distretto Culturale Evoluto (DCE, 2012) and the participation of the municipality of Cantiano in the initiative 'Case a 1 euro'.

The settlement structure of the area is characterized by small towns, rural villages, productive localities, and a constellation of scattered houses in the agricultural-rural context. Reduced accessibility, regarding the considerable distance from railway stops, is added to the lack of educational offer and the high distance from DEA (Department of Emergency and Acceptance) hospitals. So, all municipalities are facing a slow and extensive process of marginalization, with an evident phenomenon of abandonment by residents, equal to 9.33% from 2010 to 2019, with greater impact in Apecchio and Serra Sant'Abbondio. Alongside all of this, a progressive ageing of the population is recorded, with an increase in average age from 45.52 to 48.37 years, and the dramatic increase in the proportion of the population over 65 at the expense of the 0-14 and 15-64 age groups. All these processes, which present a territory in abandonment, are contrasted, in a paradoxical way, by the data on land consumption. Although there has been an evident development of all the major urban centers following the Second World War, even in recent decades they have continued an expansion that has made other areas impermeable. Only in the period 2010-16 there has been a consumption of free land equal to 160,523.52 square meters, which is even more critical considering the large percentage of abandoned, underused or disused buildings and urban voids waiting for a new destination.

The portraits of Cagli, Apecchio and Sassoferrato highlight the present built settlement, considering the buildings in relation to single anthropic-environmental elements (Figure 05 and 06). The settlement structure superimposed with the contour lines of the land (placed every ten meters) clearly shows how the

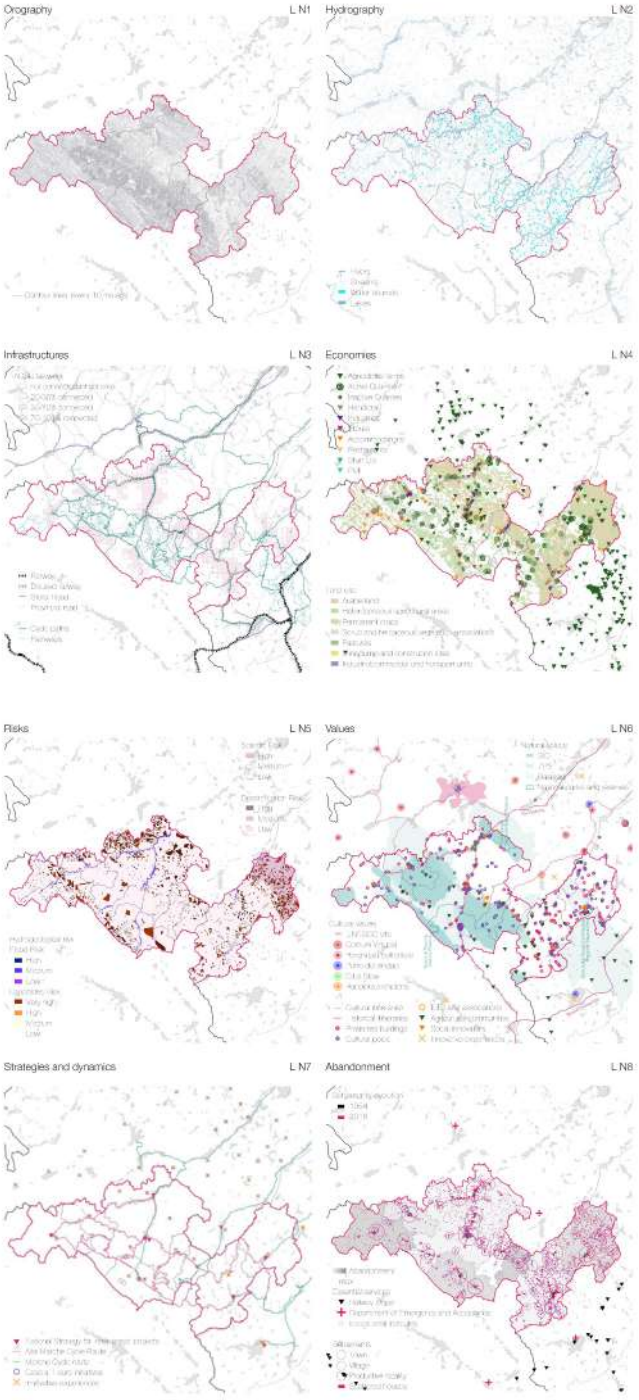


Fig. 05

Overview of Appennino Basso Pesarese-Anconetano's territorial maps. Credits: Maria Giada Di Baldassarre.

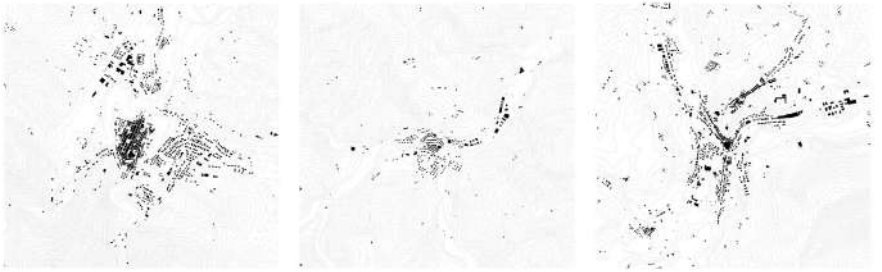
historical centers of Cagli and Apecchio arised in the flat part, and then developed later in a less organized manner perpendicular to the topographic lines of the land. Sassoferrato, instead, rises on top of a hill and then in the flat part near the river Sentino. For all the villages the built area is concentrated along the main river and then spread in a more irregular way in relation to the agricultural fields.
The main infrastructural lines (provincial and municipal roads) embrace the historical centers without ever crossing it directly, allowing a slower and more pedestrian mobility, also in relation to the Alte Marche Cycle route that connect all the municipality of the inner area. From a historical point of view, it is important to emphasise that Sassoferato is tangentially touched by a railway dismissed from 2013.
The last map highlights the abandoned, disused, or degraded spaces of the villages and intends them as new potential spaces on which to focus strategies of transformation and regeneration. In addition to disused buildings scattered throughout the historic centers, wasted areas close to the rivers and the decommissioned productive buildings are very extensive and significant.

Conclusions

In conclusion to this paper, it seems useful to clarify the innovation of the output and its relevance, but also to highlight some unresolved or unexamined issues, which may become points for further investigation. It is evident that a high degree of complexity has emerged around the exploration of Marche's inner area that it would be useful to amplify the disciplinary field to which it refers, promoting the comparison, collaboration, and exchange between different disciplines -economics, sociology, ecology, landscape design, psychology, sustainability- to analyse in more depth some evolutionary dynamics and develop more effectively the strategies to be implemented in response to contemporary challenges, considering habitats from different perspectives.
The trans-scalar process of mapping has led to a progressive deepening of the main issues concerning inner areas (depopulation, ageing and abandonment) and the continuous jumps between causes and

effects have generated new knowledge and interpretations that can be applied to other similar contexts. The result is the trans-scalar atlas, which physically represents a graphic collection of habitats portraits, but it is intended as a synthesis and description of the territory that brings out the positive and critical aspects of it, concerning different topics, and with a design and developing perspective. The results give evidence to an innovative investigation of inhabited spaces, considering the different scales and their interdependencies through a multidisciplinary perspective. This exploration allowed the proposal of a new perspective for inner areas' habitats. In fact, their spatial peripherality has preserved built and natural qualities that can be considered as valuable reserves of resilience for their development, their marginal condition can be seen as a space for possibilities, and the spatial qualities can encourage new design dynamics, making them suitable test fields for innovative and sustainable ways of living.

Orography Cagli Apecchio Sassoferrato



Hydrography Cagli Apecchio Sassoferrato

Infrastructures Cagli Apecchio Sassoferrato

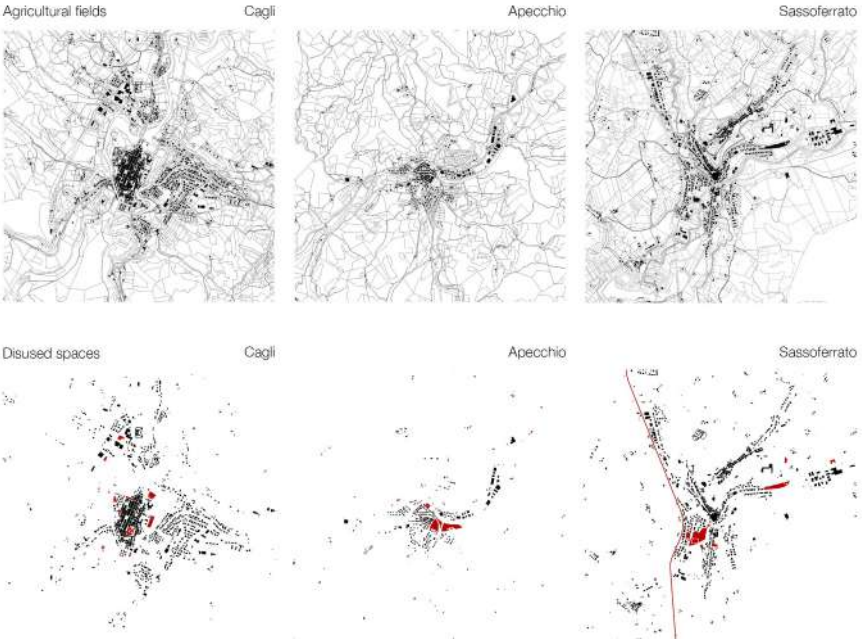


Fig. 06

Overview of local maps of the villages of Cagli, Apecchio and Sassoferrato.
Credits: Maria Giada Di Baldassarre.

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Sailing the Farm. Three Projects about Ground and its Politics onto Water Surfaces.

Food cultivation; Floating platforms; Urban politics; Water surfaces; Non-human

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In contexts like the Netherlands and the coastal cities of the United States, affected by complex food supply chains and land scarcity, architects have sought new profitable opportunities away from the land, addressing water as a surface for urban settlement. The architectural debate depicts water surfaces as a useful space: it offers a viable solution to the urban soil consumption; it could sustain and provide local food production directly within cities; it could perform urban land processes with greater flexibility and movement. The recent construction of the first floating dairy farm in the harbor of Rotterdam figures as one of the first, prototypical embodiments of this debate. Nevertheless, the urgencies and the narratives behind the project are not new. On the contrary, they descend from a series of countercultural and artistic projects that since the late seventies address water surfaces as a ground suitable for food cultivation. In the attempt to build up a genealogy of this narrative, three apparently disjointed projects will be investigated with the purpose to unfold different politics of the ground, starting from an urban towards an ecological perspective.

Displacing the ground. The floating dairy farm in Rotterdam.

On a March morning of 2018, an anonymous concrete barge suddenly appears in the harbor of Rotterdam. Towed by two tugboats, the floating platform is empty, except for a plastic cow model placed onto a synthetic grass carpet (Figure 01). Such Dadaist ready-made– perhaps easy to mistake with an animalist's flash mob, slowly drifts towards Merwehaven, an abandoned water space within the industrial harbor and recently dismissed in favor of modern and bigger logistic sites. Alongside the harbor's banks, the concrete island is being waited by a construction crew that quickly anchors it to the shore, as to relocate this small piece of ground temporarily split from the land's soil. In less than two months, a triple-stack, steel-frame architecture is being built onto the barge, apparently resembling the shape of a greenhouse. However, the greenhouse hosts no plants. The uncanny, floating architecture works as a dairy farm, designed for hosting a crew of thirty-two Meuse-Rhine-Ijssel cows, together with three workers.
Being one of the firsts prototypes of dairy farms floating onto water surfaces, architecture office Goldsmith describes its own design as an "agricultural

Fig. 01

"Construction of the Floating Farm has been underway since early March and is expected to be completed before the end of the year." Credits: Floating farm/ Beladon

building based on nautical principles"[1], looking carefully to the layout of each stack. The upper floor hosts the cow garden and several robots that milk and clean cows' manure; the intermediary and the bottom floors host technical facilities and a didactic space. The result is an autonomous and almost transparent architectural object, floating close to the harbor's shore as a capsule. It may look like also as a building that has been un-grounded and displaced off the land, now laying onto a flat and empty surface (Figure 02).
In the words of the investors, Peter and Minke Van Windergen[2], the project is a prompt architectural strategy able to tackle some specific urban issues. Indeed, the design tries to "prevent food losses, reduce food transport and improve food quality"[3], while figuring as a future prototype for a flood-prone building. The rhetoric behind the floating dairy farm project could be ascribed within the debates of the future of urbanism design thinking in face of the 'grand narrative' of global warming[4]. Indeed, after decades of urban growth and soil consumption, cities like Rotterdam consider it difficult to provide the ground

Fig. 02

Goldsmith, The Floating dairy farm. Credits: Ruben Dario

1. GOLDSMITH. "Floating Farm Dairy", 13 December 2018. https://goldsmith.company/floating-farm-dairy/.
2. *Beladon Creates the First Ever "Floating Farm" in Rotterdam - Climate Action*. Accessed 17 September 2021. https://www.climateaction.org/news/beladon-introduce-the-first-ever-floating-farm-in-rotterdam.
3. AGRITECTURE. "Building The World's First Floating Farm In The Netherlands". Accessed 17 September 2021. https://www.agritecture.com/blog/2021/8/24/building-the-worlds-first-floating-farm-in-the-netherlands
4. Christophe Bonneuil and Jean-Baptiste Fressoz. *L'événement anthropocène: la Terre, l'histoire et nous*, Nouvelle éd. Paris: Éditions Points, 2016.

for cultivating local food, forcing cities to enhance a complex supply chain based mainly on importation. In contexts like the Netherlands[5], where the scarcity of the urban ground counts an historical legacy, architects have sought new profitable opportunities away from the land, addressing water as a surface for urban settlement. Thus, the debate around the future of agricultural production depicts water surfaces as a resolving ground: it offers a viable solution to the urban soil consumption; it could sustain and provide local food production directly within cities; it could perform urban land processes with greater flexibility and movement.
According to several voices within the architectural debate[6], the floating dairy farm should not be read just as a short-term solution. While advocating for an adaptation of urban dynamics to existing and forecast climatic mutations, architects consider the floating dairy farm as a relevant suggestion for a possible future of urbanism driven by well-known (and perhaps abused) core architectural topic: high technological automatization, energetic self-sustainability, flood resilience, zero carbon footprint emissions. However, in the attempt to find alternative perspective through which looking this project, we discover how this rhetoric linked to the conception of water surfaces as new ground is not new at all.

Escaping the ground. Sailing the farm.

At the end of the seventies, sailor Kenneth Neumeyer published a guide on how to pursue a self-sufficient and autonomous life in the open seas. The book, entitled “Sailing the Farm” is described by the author himself as a “survival guide to sea homesteading”[7], as it figures as a compendium of low-tech technologies, DIY tutorials and notions from biology and medicine.
Through his survival guide, Neumeyer described a new

5. Han Meyer. “Delta Urbanism Coming of Age. 25 Years of Delta Urbanism: Where Are We Now?”, *JDU Journal Of Delta Urbanism* 1, no. 1 (2020): 2–22.
6. Laura Mallonee. “Floating Farms Point the Way to Alternative Food Ecosystems”, *Wired*. Accessed 4 September 2021.
7. Ken Neumeyer. *Sailing the Farm: Independence on Thirty Feet – A Survival Guide to Homesteading the Ocean*. 1st ed. Berkeley: Ten Speed Press, 1981.

typology of ground able to unfold new food diets, schedules, social structures. Half of the nine sections consist of several hacks and design tutorials for settling a thorough and efficient food cultivation onto a vessel's deck. Detailed drawings and written tutorials specify how to use trays or jars as supports for cultivation of vegetable sprouts: rice, rye, pumpkins, peas, radish, lentils, beans, lettuce[8]. Thus, from the benefits of a diet based on *Spirulina* algae, to the description of how to settle an ocean dairy farm– basically a collection of vegetable milks obtained from coconut, sesame, peanut, and almond, the guide tries to give technical and philosophical dimensions of a fully self-sufficient life away from the land.

Neumeyer's claim for the "independence on thirty feet" seems to be amplified by the unique criticalities of the sea space. Within a not so far dystopian scenario, Sailing the farm addressed the sea as the last safe space on the planet, now threatened by violent climate upheavals that threaten existing settlement typologies. Neumeyer's boat figures as a survival capsule that works on multiple tasks: on the one hand, a private ecology capable of sustaining the presence of human beings at sea; on the other, a form of settlement adaptable to the restless mutations of the marine environment[9].

Nevertheless, much of Neumeyer's speculations were triggered not only from an environmental concern, but also from a political one. The lack (at the time of the guide's publication) of international agreements over marine law drove Neumeyer to address the high seas also as the vastest juridically un-normed ground existing on Earth, thus inspiring radical and escapist geopolitical speculation. Eventually this could figure as an historical reason, able to explain why sailing [your own] farm in the high seas would have allowed, in Neumeyer's words, to multiple privileges. Indeed, within a large, unclaimed surface such as oceans, new grounds would have not only pursued a radical emancipation from the jurisdiction of territories and states, but especially they would have found the space for settling alternative politics of the space,

8. Ibid, 79.
9. Ibid, 5.

specifically designed on his own individual needs[10].
Nevertheless, although American cities witnessed the presence of anti-urban movements several times during their history, it is worth to pair Neumeyer's rhetoric with other events related to American cities in that decade, such as the back-to-land movement[11][12].

Retrieving the ground. Two floating gardens in New York City.

Asked whether the city of New York could have been fed by organic farming production, the activist interviewed by journalist Roy Reed answered: "New York City is an aberration. [...] If we can do anything so that places like that do not exist, we're doing the world a favor"[13].
Similar to what BTL movements did around other American countries, even NYC was interested by critical questions regarding ecology, food production and urban ground. The urban politics driven by Robert Moses between 1934 and 1960, together with the financial crisis of 1970 altered the balance between public and private spaces[14]. During that decade, the city's neighborhoods were full of empty public lots, that were gradually reclaimed by urban communities. Many activist initiatives started to retrieve these vacant spaces for food cultivation, shedding light on the correlation between the scarcity of public ground and the difficulties to get access to fresh food.
Forty years later, NYC continued to suffer of a complex and consuming food supply chain. Most of the vegetables are imported from outside the city, as almost one third of the city's population have "limited access to places where they can get fresh produce"[15]. Although the overall surface of urban public parks is

10. Ibid, 6.
11. Roy Reed, "Back-to-Land Movement Seeks Self-Sufficiency", *The New York Times*, 9 June 1975.
12. Jeffrey C. Jacob, "American Back- to-the-Land Movement", *Community Development Journal* 31, no. 3 (July 1996): 241–49.
13. Roy Reed, "Back-to-Land Movement Seeks Self-Sufficiency", *The New York Times*, 9 June 1975.
14. *History of the Community Garden Movement: NYC Parks*. Accessed 15 September 2021.
15. SWALE NYC, "Swale NYC". Accessed 10 May 2021. https://www.swalenyc.org.

comparable as big as half of the size of Dublin–– roughly the 10% of NYC's urban surface, NYC's Parks regulation does not allow to alter the existing garden layout, hence avoiding the conversion of portions of public parks into vegetable gardens.

While neighborhoods like Brooklynn have been addressed as "food deserts"[16], citizens continue to express concerns regarding the reliance of New York to extra-urban resources and advocate the right to more public space, by claiming for grounds for food cultivation.

Nonetheless, water surfaces staged even in this context some critical case studies that reflected on the value of the ground, its ecology and their related politics.

In 2009, artist Mary Mattingly designed a barge carrying two geodesic shelters surrounded by a small vegetable garden. Through the project Waterpod, the artist gathered a cross disciplinary team composed of designers, scientists, environmentalist activists with the purpose to build a "sustainable, sculptural art and technological habitat"[17], able to drift around NYC harbor and to dock alongside the city's banks. During the 5 months performance, Waterpod worked as a nomadic landscape, reaching several NYC's neighborhoods.

The habitat Mattingly designed onto the barge is entirely built of recycled and waste materials, and it worked simultaneously as a scientific laboratory, a vegetable garden, an artistic and civic center and as a small residence for four artists. One of the two self-built geodesic domes hosted a vertical, hydroponic farm, together with a small chicken coop. Waterpod, resembles a joining point between Smithson's work and Neumeyer's farm vessel. (Figure 03).

Indeed, the barge re-enacted much of the technologies described by *Sailing the farm*: from the grey water recycler, "vertical wind turbine, solar PV panels, bicycle power, and a picohydro system"[18]. Also, the urgency behind Waterpod seems to resemble the

16. Ibid.
17. *Waterpod™ Project*. Accessed 16 September 2021. http://www.thewaterpod.org/map.html.
18. Ibid.

one of Neumeyer's project, since water surfaces are chosen for their capacity to provide a nomadic, flexible and self-sufficient ground. Despite many shared points, Mattingly's work brought the discussion regarding self-sufficiency a step forward. Within the context of NY and its urban issues, Waterpod was conceived for providing urban communities of a tool for relying themselves, without depending and stressing a complex and consuming food and resource supply chain.

Definable as a work between an artistic installation and an activist performance, Waterpod kept the attention of NYC urban departments, that allowed and supported Mattingly in expanding her research through another prototypes. In 2016, the artist was then able to design another floating barge called SWALE. Figuring as a direct development of Waterpod main topics, the entire surface of the barge hosted no buildings, rather a food forest inspired by "edible forestry, permaculture, and salt-tolerant estuary ecosystems"[19], where several plant species were cultivated. In this project, Mattingly stressed the link between public urban ground, food cultivation and ecology, strengthening food as a public right.

SWALE figured as another kind of ground. Onto the

Fig. 03

Waterpod™, 2009. Credits: Mary Mattingly. http://www.thewaterpod.org/images/gallery/pages/im_041.html

19. Mary Mattingly, *Take A Ride On Swale NYC's Floating Food Forest*, 2017. https://www.youtube.com/watch?v=hJlXw3qnOg0&list=UUlFeL718n5xywFUXB5kljEQ&index=5.

water, it is facilitated by a legal loophole that allows the artist to design a public vegetable garden, while suggesting new forms of design for urban public land. (Figure 04)

Fig. 04
NYC's floating food forest. Credits: Swale and Strongbow

Epilogue. Who owns this floating ground?

As we witnessed, the idea of looking at water surfaces as a new ground for cultivation spans across the recent history through a non-linear trajectory. However, the projects showcased in this essay share together some common assumptions. Thus, across heterogenous aesthetics and programs, *Sailing the farm*, Waterpod and the floating dairy farm projected beyond the urban soil at least three distinct images and narratives of alternative ways of *water-as-a-ground*.

For instance, as a counter-cultural project, *Sailing the farm* could be considered as an apology of a voluntary exile, a rejection to the land and its politics in favor of an autonomous life in high seas.

Onto the floating ground that Neumeyer envisioned, the cultivation of food figures as the most significant image of a new political freedom and autarchy. Indeed, *Sailing the farm* offers tools for turning high seas into an available ground not only beyond the American city, rather beyond the land itself. The large repository of technologies, scientific notions and self-construction tutorials mean more than a user's guide. They perhaps

figure as an open-access technology, able to give to non-specialized people the capacity to get a personal and customizable ground. Through the use of Neumeyer's guide, people could be – at least theoretically, able to design their own personal food cultivation, pursuing in this way an individual and autonomous ground.

Whether we consider this assumption, "Sailing the farm" seems to address high seas as a vast and available surface, onto which people are allowed to settle their own floating ecology. However, the resulting dystopic image resembles a fragmented archipelago of private and autonomous islands, in which seas are considered more as a common support, rather than a communal space.

In both continuity and opposition, such position is critically reprised by Mattingly's artworks. In a leap from the high seas to the city harbor, both Waterpod and SWALE are artworks that matches the act of cultivation with the rights of citizens to public spaces, somehow sharing the rhetoric behind Sailing the farm. However, in Mattingly's works the purpose is not the one of escapism and autarchy. Whether the legal loophole legitimated the artist to freely cultivate and use the floating ground of the barge for food cultivation, Mattingly designed the two performances for advocating NYC harbor as the last public ground of the city. Indeed, the purpose behind both of the Mattingly's works is two-fold. On one side, the projects work as a critical comment of the existing unavailability of land soil for cultivation; on the other, they advocate the harbor's waters as commons, inviting communities to gather around a collective responsibility of water surfaces. Indeed, the ground narrated by Waterpod and SWALE is intended to work as a public space, where citizen could gather and share goods and resources, with the hope to develop better food supply chain.

Within this debate, the floating dairy farm sets away from the struggle for public urban ground. Differently from the first two cases, the floating dairy farm materialize into a physical project the environmental concern already present both in Neumeyer's and Mattingly's rhetoric.

In this context, the issue of the reliance of cities to complex food supply chain, together with the lack of

cultivable soil, appear emphasized due to ongoing climatic mutations such as rising sea level, much evident in geographically critical contexts like Netherlands.

According to John Palmesino, the environmental concern already stated in 'Sailing the farm' and 'Waterpod' urgencies, it has recently become a "growing horizon"[20] that is slightly "recasting territories, narratives, knowledge and practices"[21]. Within the debate on the consequences of climate change on urban processes, the words of Palmesino frame a change in the narrative of the l*and-as-a-ground*: from the necessary element that provides the Vitruvian firmitas to a non-renewable, increasingly rare, and hydrogeological unsafe resource. In the long run, the uncertain and unpredictable scenario of rising sea level may be considered not only a tangible risk or a new challenge to be faced, but especially a phenomenon able to enhance the perception of already occurring urban processes. Specifically, in highly urbanized and metropolitan areas, the "growing horizon" seems to emphasize the scarcity of the soil for food cultivation.

The urgency to redefine the politics of the urban ground derives nowadays from the fact that the soil is perceived as a finite and scarce resource. Rather than public or private, the project considers the land soil in terms of ecologically safe or unsafe, rather than claimed or unclaimed.

In conclusion, although the cultural and contextual heterogeneity of all these projects, they nevertheless show a common approach towards the ground as an ecological resource. Whether Sailing the farm, Waterpod, SWALE and the floating dairy farm show respectively how to replicate, escape and retrieve the ground onto water surfaces, they nevertheless put in motion as a process of spatial subtraction from a physical environment that should rely on a communal responsibility.

As stated in the project *The Architecture of the Ground*

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20. Ann-Sofi Rönnskog and John Palmesino, "When Above", e-flux architecture. Accessed 19 November 2020. https://www.e-flux.com/architecture/oceans/331872/when-above/.
21. Ibid.

by the architecture office TVK, thus the ground could be described as an ever-changing matter, an unfinished project that is continuously designed by the process and the programs of the architectural objects. The act of designing the ground – whether it implies its modelling or its complete replication – lead to think of it as transformation in the relationship between public and private, between particular and communal, through a process of subtraction[22].

In all the three projects, water is an element that pre-exist and support the project process, allowing designers, activists and artists to unfold an alternative narrative of ground. From its undefined status of common space, water surfaces are continuously transformed and narrated by urgencies and intentions, charged of precise spatial politics.

As the future developments in urban design thinking will look at water surfaces as a new ground, it could turn useful to take into account an extended meaning of politics, able to embrace both urban and ecological urgencies.

22. *Architecture of the Ground*. Accessed 4 September 2021. http://tvk.fr/en/architecture/architecture-du-sol.

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S.03
DESIGNING

Designing the Accessibility of Ground(s) through Data and Design-Driven Methods.

Design Discipline; Accessibility; Data; Intersectionality; Social inclusion

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The concept of Ground(s) can be defined as a set of multivalent spaces and it will be delineated according to three levels of meaning: Ground as a functional space, Ground as a relational space, Ground as a mediator.
In terms of sustainable development, the question of these different levels being truly accessible and inclusive to the actors who live and use them becomes necessary, with the aim of identifying tools useful to create a narration and an inclusive development of these spaces. The aim of this paper is to show, through a selection of case studies, how creative and cultural disciplines can represent the practice of designing more accessible and inclusive ground(s) through an intersectional approach, promoting the empowerment of individuals within society that become active drivers of sustainable change, also taking into account the phenomenon of digitization and the concept of data that could be

interpreted as tools for inclusive narration of material and immaterial spaces.

Ground(s): function, relation and mediation

The contemporary daily life of humans is characterized by new spatial forms that present a constant interaction between environment, people and digital artifacts, where material spaces and virtual networks actively connect with each other[1].
The Spaces of Flows[2] have revealed the critical need to analyze and significantly interpret[3] the challenges of the environment in which we live, by perceiving tangible and intangible manifestations in order to dynamically react and design in an inclusive and mutable way.
The concept of Ground(s) is related to this context and is characterized by relevant design and social interest in relation to manifestations and challenges of the present.
If the concept of "ground" generally refers to a set of heterogeneous characteristics related to a physical surface, which takes on a specific meaning according to the function attributed to it[4], the same concept of Ground(s) can be read more broadly if we consider space not only as physical, but also as an intangible space where social relations and experiences take place. Therefore, this concept can be identified by the relationship between two different meanings which invoke its more material aspect but which, parallelly, identify it as an intangible space of social and experiential development, approaching the urban space identified by the inseparable binomial of ville and citè[5].
In this paper we will propose an interpretation of the concept Ground(s) as a set of multivalent spaces, collecting different functions and types of activities.

1. Carlo Ratti and Matthew Claudel, *The City of Tomorrow*, (London: Yale University Press, 2016), 22.
2. Manuel Castells, *The Rise of the Network Society*, (Cambridge: Blackwell, 1996), 412.
3. Carlo Ratti and Matthew Claudel, "Le smart cities di domani", *Aspenia,* no. 63 (2013): 190.
4. https://dictionary.cambridge.org/it/dizionario/inglese/ground
5. Richard Sennett, *Building and Dwelling, Ethics for the City* (New York: Farrar, Straus and Giroux, 2018), 11.

Following this introduction, the notion will be analyzed and defined according to three levels of meaning:

1.1 Ground as functional space

If we consider the more material meaning of Ground, it refers to surfaces or three-dimensional spaces whose functions are defined by the function attributed to them.

The attributed function also becomes the element able to define the interactions taking place with and between this type of Ground. This level can be represented by:

- Rural and/or abandoned spaces which are undergoing a change of function due to new urban planning policies of a strategic nature, such as former industrial areas being converted to agriculture;

- Spaces which are undergoing a change of function due to actions of urban acupuncture[6], such as pedestrianizing interventions or the introduction of temporary greenery;

- Spaces defined on the contrary by lack of functionality, such as disused areas that become the object of manifestation of nature within anthropized spaces[7];

- Connecting spaces or spaces dedicated to the mobility of humans.

1.2 Ground as a relational space

This level aims to define a concept of Ground as a three-dimensional space with a function linked to the relationships that occur within it. On this level there are spaces characterized by facilitating, physically or symbolically, the construction of relationships. The

6. Marco Casagrande, "Urban acupuncture", http://thirdgenerationcity.pbworks.com/f/urban%2520acupuncture.pdf [Accessed 07 September 2021]
7. Gilles Clément, *Manifesto del Terzo paesaggio.* Edited by Filippo De Pieri. (Macerata: Quodlibet, 2005), 9.

following types of spaces are examples of this level:

- Spaces with physical constitutions that promote relationship building, such as squares, porticoes, or open green spaces;

- Border spaces[8], which can represent both a boundary and a meeting point[9];

- Spaces characterized by porosity[10], as permeable spaces which take on their own morphological characterization manifesting themselves in different ways and interpretations to those who experience them.

1.3 Ground as mediators

Finally, the concept of Ground can be considered as an immaterial and digital space whose meaning is connected to the role of mediation which it can have in relation to individuals, intended also collectively, and artifacts. This definition of Ground(s) is related to the constructivist perspective of Actor-Network Theory: according to this view, it is necessary to consider that digital or non-digital artifacts can produce effects which influence the space of human social relations[11].

The Ground(s) belonging to this level are in fact to be considered as mediators, rather than intermediaries, because they not only act as a connector between individuals but promote an impulse of transformation in the relationship between them[12].

This level includes the digital spaces created by data, understood both as the product of the activity of

8. Richard Sennett, *Building and Dwelling, Ethics for the City* (New York: Farrar, Straus and Giroux, 2018), 220.
9. Ivano Gorzanelli, "Traces for an Idea of Project: Discussing the Contribution of Richard Sennett, Tim Ingold and Bruno Latour", *CPCL*, No. 2 (2019): 21.
10. Walter Benjamin, *Immagini di città,* tras. Hellmut Riediger, Marisa Bertolini Peruzzi, Gianni Carchia, Giorgio Backhaus and Enrico Ganni. (Torino: Einaudi, 2007): 21.
11. Bruno Latour, "On Actor Network Theory: a Few Clarifications", *Soziale welt*, No. 47 (1996): 369-370.
12. Paolo Volontè, "Il contributo dell'Actor-Network Theory alla discussione sull'agency degli oggetti", *Politica & Società*, Vol.1 (2017): 36-37.

automatic machines - thinking, for example, of the influence of IoT systems - and as the product of human actions that are *datafied* by sensor systems used daily.
In the analysis and narrative of the relationship between people and environment, the three levels of Ground(s) are proposed both as spaces and as tools for promoting actions and relationships between individuals, clarifying how the physical space is no longer absolute, but must deal with different types of intangible spaces.
As a result of this introduction, the question of these different levels being truly accessible and inclusive to the actors who live and use them becomes necessary, with the aim of identifying lines of action that promote the future design of more inclusive spaces.
The issue of openness and accessibility of spaces is also mentioned in European and international strategic planning, both at the level of policy-making, as in the case of the 2030 UN Agenda for Sustainable Development[13], or in the idea of just transition expressed in the European Green Deal[14], and at the level of designing solutions, as in the case of the Horizon Europe 2021-2024 framework programme (Fig. 1)[15].

Designing Ground(s) through inclusive approaches and data

The three levels of Ground(s) previously identified can be useful in the consideration of the practice of their design.
In fact, from the point of view of design disciplines, the creation and prefiguration of new Ground(s) must take into consideration some phenomena which are characterizing the contemporary world, such as the

13. United Nations, *The 2030 Agenda for Sustainable Development*, 2015. Available at: https://www.un.org/sustainabledevelopment/development-agenda/
14. European Commission, *Communication from the Commission: The European Green Deal*, 2019. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1588580774040&uri=CELEX:52019DC0640
15. European Commission, *Horizon Europe Strategic Plan (2021-2024)*, 2021. Available at: https://ec.europa.eu/info/sites/default/files/research_and_innovation/funding/documents/ec_rtd_horizon-europe-strategic-plan-2021-24.pdf

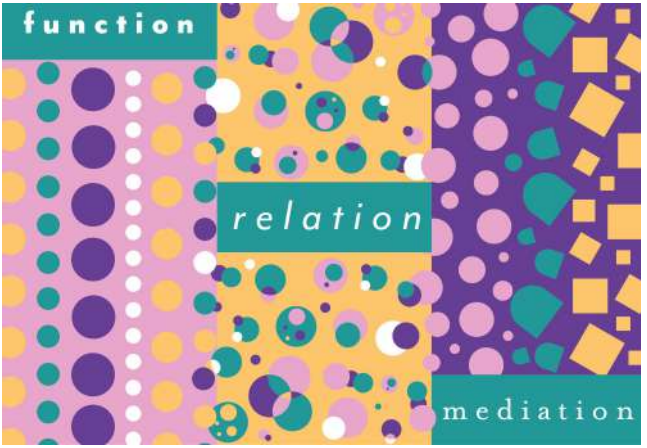

Fig. 01

Ground(s) as a set of multivalent spaces . Credits: Margherita Ascari and Virginia Vignali.

need to build sustainable solutions, both from an environmental and social point of view, and the digitization processes. In this context, design tools and cultures can represent key elements in the accessible reading and analysis of Ground(s); they can also be active drivers to build inclusive material and immaterial spaces, providing a design methodology aimed at a transition towards a sustainable future.

The notion of sustainable development can be considered in a multiplicity of interpretations, which are based on principles of intergenerational and intragenerational equity, related to environmental and social dimensions[16].

Accessibility and inclusion are both relevant to this topic[17], including the debate on human rights, cultural diversity and democratic governance.

Behind these issues, we can interpret questions of equity and social justice through the concept of autonomy[18], defined as the individual's possibility to develop awareness and self-determination within society. This idea also refers to the acknowledgment

16. Brundtland Commission. *Our Common Future: Report of the World Commission on Environment and Development* (1987): 16.
17. United Nations and Department of Economic and Social Affairs, *Disability and Development Report: Realizing the Sustainable Development Goals by, for and with Persons with Disabilities*: 2018, 2019.
18. Micaela Antonucci, Francesca Aragall and Valentina Gianfrate. "Design for People Autonomy", *CPCL*, No. 2 (2020): 2.

of the human right to be able to conduct an independent life, in the participation in policy-making activities and in construction of urban governance, allowing all people to take part in this process, in particular marginalized communities, claiming their "right to the city" and recalling the notion of social empowerment, understood as an intentional process of growth within the community[19].

In design cultures, the issues of accessibility, inclusion and equity are represented as multi-disciplinary notions that must be transversally integrated to address social and sustainability challenges.

These topics refer to a set of characteristics that make experiences open to fruition for all individuals[20], acting as an object of study for a design approach aimed at addressing a heterogeneous ecosystem of actors.

The goal of developing inclusive and universal contexts has laid the groundwork for the development of different design approaches, such as Universal Design, Design for All and Inclusive Design, which differ in their modalities, processes and application areas but are, at the same time, connected by the search for universal needs and equitable design.

The goal of this paper is to consider design practices, from an intersectional perspective, by evaluating and analyzing how social identity factors intersect and interact with each other[21], following an allocentric design perspective[22].

The designer can gain a deeper understanding of the context of use and the needs of the individual within the community by examining how these factors combine and incorporate the experiences of different communities with culture, policy, and design.

Intersectionality allows to expand the idea of accessibility, addressing the notions of openness and universality and relating to a transdisciplinary approach that takes into account all those social

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19. Cornell Empowerment Group. *Empowerment and family support*. (Networking Bulletin, 1989): 1-23.
20. Kat Holmes, *Mismatch: How Inclusion Shapes Design* (Cambridge: MIT Press, 2020): 123.
21. Kimberle Crenshaw, "Demarginalizing the Intersection of Race and Sex: A Black Feminist Critique of Antidiscrimination Doctrine, Feminist Theory and Antiracist Politics", *The University of Chicago Legal Forum,* vol. 140 (1989): 139-167.
22. Paola Antonelli, "Broken Nature", *Broken Nature: XXII Triennale di Milano*, (Milano: La Triennale di Milano, 2019): 21.

aspects that imply structural inequalities (e.g. gender, ethnicity, disability, socio-economic status, etc.); the debate then extends to frameworks of collective responsibility and action towards practices that are inclusive, egalitarian and socially just.

Another phenomenon that must be considered when approaching design in the contemporary world is digitization. In fact, if it is possible to say that digital systems are characterized by pervasiveness and ubiquity[23] it is necessary to take into account the effects that these systems may cause on physical space, as well as on the space of relationships that occur between individuals[24].

Digitization has to be considered at any level of design process, especially when design actions intersect with the topic of sustainability.

In addition to this, there is the possibility of creating, completely or partially digital spaces, whose minimum constituent element is data. Data, in fact, are a useful element for design because of their dual nature: on the one hand, they can be considered the product of a process of measuring a natural phenomenon; on the other hand, they can be considered a filter through which to read different aspects of reality. Considering this dual nature is useful to focus on how data can be an element to be considered within design processes.

In the following section, a selection of three case studies, chosen from a more comprehensive range of good practices, will be presented. Those cases demonstrate how design approaches can consider the use of data as a tool for understanding and for inclusive storytelling of the three levels of Ground(s), and how they can foster accessibility and intersectionality. These case studies are meant to be illustrative in showing how design disciplines can serve as an active driver in constituting Ground(s) models as building blocks within the just transition, repositioning these disciplines within the political and social mobilization advocated by the European Green

23. Giuseppina Pellegrino, "Ubiquity and Pervasivity: On the Technological Mediation of (Mobile) Everyday Life", *IFIP International Federation for Information Processing Vol. 223,* ed. Jacques Berleur et al., (Boston, Springer, 2006): 133-144.

24. Luciano Floridi (ed.), *The Onlife Manifesto: Being Human in a Hyperconnected Era*, (London: Springer, 2015): 7-8.

Deal[25].

Case Studies

"Thea": Enabling the visually impaired to better navigate their world

Thea[26] is the result of a research and co-design process with communities of blind and visually impaired people led by a group of students and the Moment Design Team. The project consists in artificially intelligent, on-the-go navigation assistant, which, using the data obtained from the continuous positioning abilities by 5G wireless technology, a set of wearable haptic pads, a voice-activated user interface and audio and tactile feedback allows people with vision disabilities to move independently and safely, overcoming the challenges and difficulties related to mobility. Thea is a tool designed to be used in specific spaces dedicated to movement, connection and passage, within which the interaction of individuals with the context occurs depending on the action of movement that is carried out. The level of Ground(s) in which Thea fits, depending on the design features that define it, is the space of function, as the system is designed to be used in areas dedicated to urban mobility, which therefore have the function of making possible the movement in different points of the urban context.

"Detoxing architecture from inequalities: a plural act"

"Detoxing architecture from inequalities: a plural act"[27] is a research project realized by RebelArchitette Association, included in the "Resilient Communities" Pavilion curated by Alessandro Melis at Biennale Architettura 2021 in Venice.

The proposed installation aims to highlight the activities of 137 women working in the field of cultural practices, through an intersectional approach, privileging a selection of new models still invisible

25. Damian White, "Just Transitions/Design for Transitions: Preliminary Notes on a Design Politics for a Green New Deal", *Capitalism Nature Socialism,* Vol. 29 (2018): 1-20.
26. For more information about the project: http://momentdesign.com/thea/
27. For more information about the project: https://www.rebelarchitette.it/rebelbiennale2021/

within a professional culture that often reveals an indisputable gender-gap. The project has been conceived to propose an augmented, interactive and accessible experience, through three levels of participation: a physical exhibition, a web platform where to deepen the work of the Italian female architects identified and a virtual version of the path.
The characteristics of the physical and virtual installation created by RebelArchitette create a three-dimensional space that aims to stimulate dialogue on the issues of democracy and women's perspective and to create a new network of possible collaboration; in fact, it fits within the definition of Ground(s) as a space of relationship, encouraging the construction of physical and symbolic connections, proposing a debate on an urgent and current issue.

The Crime of Rescue – The Iuventa case

"The Crime of Rescue - The Iuventa case" (2018)[28] is part of the investigation "Blaming the Rescuers" carried out by Forensic Oceanography and Forensic Architecture, which aims to refute several accusatory theses against some NGOs of complicity with groups of smugglers, trying to discourage migration flows in the Mediterranean. The project consists of a video that uses architectural representation as an analytical approach and the methodologies of Fluid Dynamics, Synchronisation, Remote Sensing, for the reconstruction of events at a later time.
In this project, the reconstruction of the physical space in a digital format allows one to obtain an alternative perception of the events that took place within it. This duplication therefore constitutes an element of mediation between the individuals who interact with the digital space as it allows to build an alternative debate to the official version of the events while opening the dialogue to individuals who have not personally enjoyed the physical space.

Conclusions and future perspectives

28.For more information about the project: https://forensic-architecture.org/investigation/the-seizure-of-the-iuventa

This set of case studies shows how creative practices and cultures can provide tools to analyze and understand the complex systems that characterize the present, adopting a holistic approach to the design and reworking of Ground(s).
This research, which is currently in an early stage of development, stems from the idea that the designer can act individually as an active individual at a widespread level, stimulating and encouraging profound changes at a social level, supporting diversity as a driver of change towards sustainable development. In this context, design discipline is proposed as a connective and restorative element through the dissemination of design approaches and strategies and the aim is to analyze these practices through detailed mapping in order to disseminate them.

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Four Revisions toward an Embodied Landscape Architecture Practice.

Embodiment; Landscape; Care; Performativity; Citizen

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This paper suggests a revision of four landscape architectural concepts as a way to make room for working with the generative force of embodied citizen action in practice. This embodied landscape architecture practice recognises the performative capacity and generative force of citizens' action as a primary means of enacting environmental stewardship and care. The Four Revisions Toward an Embodied Landscape Architecture Practice discussed in this paper emerge as the characteristics of embodied action challenge established landscape architectural concepts and traditional disciplinary knowledge. More specifically, accommodating citizen action within a practice means moving towards a way of working that is not grounded in geographical space but instead occurs in a relational paradigm whereby citizen's actions, rather than those of the landscape architect, change landscapes. The four proposed revisions include addressing discursive sites, embodied action, facilitation, and embodying tactical urban opportunities. While these ideas are not new, their use in landscape architecture practice helps foreground embodied action in ways that can be useful catalysts for citizens to enact essential practices of care for landscapes.

Introduction

It is becoming increasingly important that we find ways to work with the productive and performative capacity of citizens to enact care for societies and ecosystems. At a global scale, the agency of human action is increasingly recognised as contributing to rapid and catastrophic environmental transformations which affect landscapes worldwide. Yet continually rising populations and persisting cultures of excessive production and consumption are putting unprecedented pressure on ecological and social systems alike. The embodied approach to landscape architecture presented in this paper leverages the recognised agency of human action, and is characterised by working directly with performative, individual citizen actions as a means of challenging these trajectories of broad environmental degradation by transforming and restoring localised landscapes through acts of care. As traditional approaches to landscape architecture tend to work with the ground to create landscapes for citizens rather than with them, what is presented here are four key revisions which expand landscape architectural concepts to better accommodate and effectively work with the nuances and generative potential of embodied citizen action. While these revisions borrow established perspectives from the arts and cultural theory, their use in landscape architecture helps foreground embodied action in practice. Combined, these revisions provide an effective way for landscape architects to work with citizens to instigate small but catalytic actions with the intention of making changes in landscapes.

Human action in landscape and landscape architecture

This embodied approach to landscape architecture was developed in response to a concern for the impact that we, as humans, are having on society and ecology. In 1974, Henri Lefebvre commented that the modern tendency to value economic exchange and the production of products over human use and creativity had rendered humanity the “anti-nature”, where the human body, being of nature itself, is simultaneously

committing itself to suicide[1]. Lefebvre's concern was qualified at that time by data published in the 1972 MIT study "The Limits of Growth" which predicted the collapse of civilization around the year 2040 *if* the then current practices continued[2]. This issue is compounded as the study authors noted that "only a small fraction of the global population is actively concerned with understanding these problems or seeking solutions"[3]. That human actions dominate and thus dictate environmental systems has since become more popular knowledge. This is evidenced through the popularisation of the "Anthropocene Epoch"[4], which recognises human action as being the primary force in shaping the global ecosystem. Any yet, the IPCC's "Climate Change 2021" report demonstrates that human-induced climate change is still causing temperatures to rise, triggering severe weather patterns and a drastic change in the global environment[5]. We are, more than ever, a modern "anti-nature". It is now essential we find ways to subvert these trends caused by human actions.

The embodied approach to landscape architecture presented here stands to oppose current trajectories of social and ecological degradation by cultivating practices of care as alternates to everyday actions undertaken by citizens. Care is cultural and temporal, occurring within and through relationships[6]. As such, this approach to practice works to establish relationships by brining citizens into embodied, performative encounters with landscape systems in

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1. Henri Lefebvre, *The Production of Space,* trans. Donald Nicholson-Smith. Oxford, UK: Wiley-Blackwell, 1991, 71
2. Edward Helmore, "Interview: Yep, it's bleak says expert who tested 1970s end-of-the-world prediction", *Guardian News* (Sydney, Australia), July 25, 2021, https://www.theguardian.com/environment/2021/jul/25/gaya-herrington-mit-study-the-limits-to-growth
3. Donella Meadows et al. *The Limits of Growth: A report for the Club of Rome's project on the predicament of mankind* (New York: Universe Books. 1972). 17
4. Paul Crutzen, "The Anthropocene," in *Earth System Science in the Anthroposcene: Emerging Issues and Problems*, eds. Eckart Ehlers and Thomas Krafft (Heidelberg: Springer. 2006), 13-18
5. Intergovernmental Panel on Climate Change (IPCC), Climate Change 2021: *The Physical Science Basis*, 6th Assessment Report (Working Group 1, 2021) https://www.ipcc.ch/report/ar6/wg1/#FullReport
6. Laurene Vaughan, "Design as a Practice of Care", in *Designing Cultures of Care*. eds. Laurene Vaughan (London: Bloomsbury, 2018), 7-18

Fig. 01

Diagrammatic contemplation of citizen action in the city. Credits: Alice Lewis 2020.

ways that demonstrate the need for care practices and introduce actions that can transform localised landscapes and productively affect broad environments.

The term "Landscape" means and does different things, depending on the historical, geographical or social context from which it is being perceived[7]. Within landscape architecture, it is a complex medium linking space, action and experience in ways that situate the body in an appositional relation such that landscape "enframes our daily lives"[8]. To *practice* landscape architecture is traditionally to work with this spatial medium across scales and over time, affording practitioners the agency to affect and enculture actions and experiences of space. However, a separation has endured in which the body, recognised as acting in the landscape, is located as a seemingly separate yet performative entity, thereby limiting ways

7. Kenneth Olwig, *The Meanings of Landscape: Essays on Place, Space, Environment and Justice* (New York: Routledge. 2019), 1

8. James Corner, "Representation and Landscape," in *Theory in Landscape Architecture: A Reader,* eds. Simon Swaffield (Philadelphia: University of Pennsylvania Press, 2002), 146

to engage *with* the body in practice. Approaching embodied and relational citizen action as a means to provoke transformation within local material landscapes to affect broad environmental processes means approaches to landscape architectural practice need to expand accordingly.

The expanded field of landscape architecture is outlined by Elizabeth Meyer as practicing within a field of "hybrids, relationships, and tensions" *between* binaries of man-nature/culture-nature/landscape-architecture[9]. This definition offers a useful opening for the care and experience of landscape through approaches that are "predicated on a continuum between human and nonhuman nature, upon a recognition that the land is a cultural and physical product and that people are living organisms"[10]. In acknowledging these tensions, this expanded field works to negate the persisting cartesian dualism which has traditionally separated body from nature, both in the perceived relationship of the body to landscape (and in landscape architecture) and in western society more broadly[11]. My embodied approach builds on Meyer's conceptual foundation of the expanded field as a foundation for cultivating new relations with landscape and landscape systems which provoke awareness, care and environmental stewardship.

Citizens and the city

When practicing with human action, the city is at once the opportunity and the cause for action. The city is a landscape typology that is both physical and temporal. It is a geographic, built manifestation of the more elusive "urban concept" – an intangible phenomenon characterised by assemblies of relation and use[12]. The

9. Elizabeth Meyer, "The Expanded Field of Landscape Architecture," in Ecological Design and Planning eds. George F. Thompson and Frederick R. Steiner (New York: John Wiley and Sons Inc. 1997), 51
10. Meyer, "The Expanded Field of Landscape Architecture," 51
11. Alice Lewis, "Citizens Prostheses Landscapes: Towards an Embodied Practice of Landscape Architecture" (PhD dissertation, RMIT University 2020), RMIT Research Repository 9921910011801340
12. Henri Lefebvre, *Writings on Cities*. trans. Eleonore Kofamn and Elizabeth Lebas (Oxford: Blackwell Publishing, 1996), 103

opportunity arises in this capacity to assemble people into intense relations; a productive condition for instigating collective action. However, the city is a landscape predicated on an excess of production and expenditure, where "citizens" become "consumers". To "consume" is to take what is offered. Thus, consumption is an inversion of "citizenship," of which the basic from is not tied to the State but recognises a collective negotiation between a population and the structures of decision making, such as governance and law, that shape what it is to be a citizen in each specific society[13]. However, as cities value economic exchange over use, the embodied capacity of citizens to contribute to space, and to be held accountable for how we participate in dominant cultures of consumption, has fallen to the wayside in both urban planning and in everyday action. The city is a cause for action as disembodiment of relations between the landscape and broader environmental impact of our everyday actions allows current destructive practices to continue unabated. As such, this embodied approach was developed in the city; attempting to bring citizens into relation with landscape systems in ways which provoke awareness and care for local landscapes and the environment.

Four revisions toward an embodied landscape architecture practice

As traditional landscape architecture practice works with the ground to create landscapes for citizens rather than with them, making space for citizens in an embodied landscape architecture practice requires that some revisions be made to established concepts. In recognition of the autonomy and individuality of citizens, and to some extent cities too, this approach privileges invitation, interpretation, tactical implementation and ongoing use over finite organisational orders and end points. This shifts the emphasis of landscape architecture practice from the sited and the objectifiable, towards the lived,

13. Habitat International Coalition, *World Charter for the Right to the City*, trans Jodi Grahl. Habitat International Coalition. https://www.hic-net.org/world-charter-for-the-right-to-the-city/

performative and relational. This change in focus and conditions necessitates the revisions discussed here. The process of revising concepts does not cancel out those already existing but expands each to accommodate characteristics of citizen action. While the revisions discussed here draw on well-known artistic or tactical urban approaches which foreground embodied action or participation, their originality here is in their combined use in landscape architecture practice. As care practices cannot exist without relation, the specific combination of revisions enables landscape architects to both activate and engage with this relational, embodied situation. In other words, it makes this embodied landscape practice possible by ethically accommodating the performative and relational nuances of both citizens and the city.

Revision 1: From For to With Embodied Action in Landscape Architecture

Revision 1 covers a shift from creating landscapes for citizens to embody, to transforming landscapes *with* their ongoing embodied actions. Foregrounding embodied action as practice requires an "opening" of practice to citizens themselves such that practice is accessible for individual and collective use. This establishes a characteristic of "openness", both as spatial-temporal quality and practice model. Framed through Umberto Eco's concept of the open work in art, which foregrounds multiple readings such that

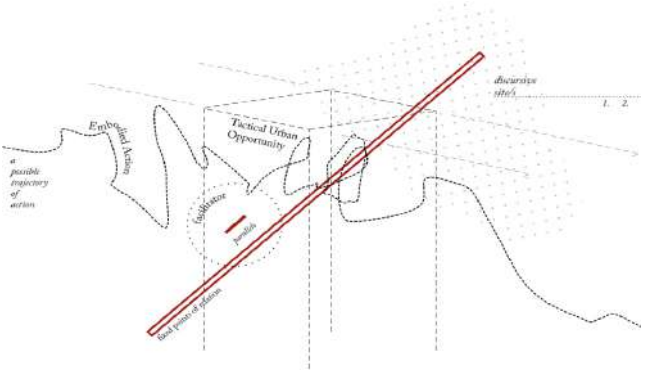

Fig. 02

Spatialization of an embodied approach to landscape architecture. Credits: Alice Lewis, 2020.

practice occurs within "*a field of possibilities*, an explicit invitation to exercise choice"[14]. The open work has been employed in landscape architecture by Kate Church as a helpful framework to "reveal and expose the irresolvable and unrepresentable"[15] impacts of the Anthropocene. My own practice builds on Church's work, using openness to both describe the landscape condition and infer a process-orientated practice model predicated on plurality of ongoing citizen interpretation, use and transformation. This open model confers responsibility on the citizen which may, in turn, instil a sense of ownership, knowledge and care for people and spaces in ways that guide responsible, embodied citizen actions for transforming landscapes.

Embodied actions can be defined as the various movements we make in our passage through the world. Walking, using trains, buying products, gardening and eating are all embodied actions, and all impact the landscape in a multiplicity of ways. The generative and performative potential of an embodied approach in landscape architecture is in its ability to enable ways of acting that cause small yet beneficial shifts in localised landscapes, which are linked to global environments, when enacted by individuals or collective citizen communities. For example, in Australia the government mandated lockdowns in response to the Covid-19 pandemic have seen increasing numbers of people digging illegal mountain bike trails through peri-urban nature reserves. My recent work with landscape architecture students at RMIT explores ways of bringing "pirate trail builders" to encounter significant or endangered flora and fauna species occurring within nature reserves. The intention being that an increased awareness may contribute to increased care and a reduction in digging. Students design infrastructures to cultivate a *field of possibilities* however practice is thought to happen *through* the actions undertaken by trail

14. Umberto Eco, *The Open Work*, trans. Anna Cancogni (Cambridge: Harvard University Press, 1989), 1
15. Kate Church, "Embracing Imminence: Land … scapes and the Peculiar Distance", (PhD dissertation, RMIT University, 2017), 23

builders as a result of encounter and the transfer of knowledge. This move toward embodied action revises the focus from formal built spaces in landscape practice. The result of working with embodied action is that practice is always provisional and in process towards intentional landscape transformation.

Revision 2: From Grounded to Discursive Sites

Working within a performative, relational practice paradigm necessitates a revision of "site", as the space of embodied practice moves away from a grounded, tangible concept of site to settle (or not settle, as it were) in the discursive space of performative effect. Traditional landscape architecture practice approaches site as a defined space and geographical location. The boundaries of this kind of site are recognised as political overlays, while the space itself is known to be part of the fluctuating and "limitless" landscape that surrounds us[16]. Nonetheless, the demarcated limits of site remain reducible to objectification and representation. When shifting to address embodied relational action as landscape architecture practice, the concept of "site" refuses representation to instead foreground affective relations occurring with, between and next to objects. This move toward the immaterial relations *between* puts into practice Karen Barad's proposition that our relations with objects, or "relata", infect and materialise both the body and our understanding of the world[17]. Addressed in this way, the site of practice is the space of relation *between* citizens and the places of meaning and action.

This revision is framed through artist Miwon Kwon's articulation of "discursive sites" in art practice as nomadic, scalar and "in-making"[18]. Nomadism opens "sites" to sequence and movement through which the author articulates a passage, in much the same way authorship occurs in Eco's open works. As author,

16. Corner, "Representation and Landsacpe," 146
17. Karen Barad, "Posthumanist Performativity: Toward an Understanding of How Matter Comes to Matter" in *Journal of Women in Culture and Society* 28, no. 3, 812
18. Miwon Kwon, *One Place after Another: Site-specific Art and Locational Identity (*Cambridge: MIT Press, 2002), 91

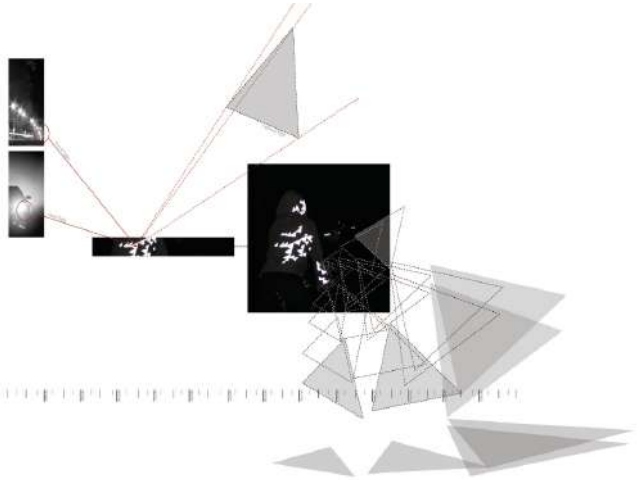

Fig. 03

The Night Brigade Experiment 2013-2015. Credits: Alice Lewis 2017.

place and action come into relation, “site” is continually generated through fleeting encounters and formation of new identities, meaning and knowledge. The fixed points of relation established by the landscape architect render visible, present or possible things that may not yet be seen or understood by citizens. The discursive site of practice can be easily recognised in a project entitled *Night Brigade* (2013 - 2015), which used specially made reflective jackets could change urban street dynamics. The work responded to mounting animosity directed towards the increasing number of cyclists on Melbourne roads by attempting to bring conflicting road user groups into a situation of momentary, mutual encounter, recognising each other as citizens, each with the right to move in the city. The discursive site manifests as car headlights illuminate the cyclist’s garments, forging a connection between both entities through which to generate different types of encounter. This process of discursive exchange involves a critical acuity to recognise, assess and take action. As it occurs beyond geographical locations, in an impermeant space *between* and *with* social and intellectual exchange, this type of site facilitates productive scalar shifts whereby one encounter may lead to a proliferation of future practice as individual

actions become verified and adopted by others.

Revision 3: From Design to Facilitation

The movement towards acknowledging citizen embodiment in practice calls into revision the role of the landscape architect, as practicing *with* citizens replaces the more traditional mode of practicing *for* them. Building on the Latin word *facilis* meaning "easy", the English noun of *facilitation* – "easy to make" – holds the promise of making new or difficult tasks achievable by others[19]. Used in the context of this practice, facilitation enables citizen encounters or actions and makes the authoring of processes, uses and widespread embodied citizen engagement possible.

Recasting the landscape architect as a "facilitator" adds a necessary pedagogical dimension to the practice. Beyond simply creating points of relation, creating frameworks for enabling the transfer of knowledge to citizens by facilitating encounters with new embodied actions is essential. This is necessary for the development of individual practices that then proliferate beyond the original site of encounter, to allow for collective uptake of actions. This approach builds upon Lefebvre's suggestion that the performative capacity of city planners, landscape architects and other allied disciplines is in their ability to help trends take shape[20]. In this context, the creation of frameworks to encounter landscapes and landscape systems helps set trends in motion through enculturing new ways of seeing and acting for citizens. Facilitation can occur through spatialised events, such as at exhibitions, though within my own work facilitation occurs largely through a prosthetic offering to extend the users embodied capacity for action. These prostheses can offer physical or intellectual support for action. For example, in a project attempting to establish an infrastructure-oriented democracy[21] amid trends of privatisation, landscape architecture students developed maps and mobile

19. Sheila Preston, *Facilitation: Pedagogies, Practices*, Resilience (London: Bloomsbury Methuen Drama, 2016), 1-2
20. Lefebvre, *Writings on Cities*, 105

applications for citizens of a Melbourne suburb. These navigational prostheses offered directions for where and how citizens might consider occupying public space in ways that asserted ownership and demonstrated custodianship of space. This type of facilitation invites moments of in-depth engagement, whereby the systems and practice being proposed by the landscape architect are "made easy" and accessible to citizens through the act of facilitating.

Revision 4: From Sited Projects to Embodying Tactical Urban Opportunities

This practice is based on the notion that tactical embodiment by the global human population could have long-term impact for environments. Michel de Certeau outlines the characteristics of "tactics" as being use, manipulation and diversion carried out by the general population of a city. In contrast to large-scale place-based strategies used by institutional organisations, "tactics" are inherently linked to the everyday actions of citizens; opportunistic actions occurring "on the wing"[22].

The established practice of "tactical urbanism" is generally considered to be "an approach to neighbourhood building and activation using short-term, low-cost, and scalable interventions and policies"[23]. As an immediate, often participatory and iterative approach, tactical urbanism brings cities and citizens together to develop more nuanced and collaborative approaches to city-making which often leverages disused space.

In this embodied practice of landscape architecture, tactical opportunities are considered any moment where a disruption in everyday processes is occurring. Such tactical opportunities presented by the forces and cracks in urban environments make my practice possible, meaning the practice remains dependant on the situations that are offered. This enables a shift

21. This was a play on Bruno Latour's notions of the object-oriented democracy and thing-power.

22. Michel de Certeau, *The Practice of Everyday Life* (Berkley: University of California Press, 1984)

23. Mike Lydon and Anthony Garcia, *Tactical Urbanism : Short-term Action for Long-term Change.* (Washington DC: Island Press, 2015), 2

from ‘project’ to ‘process’ in which geographical space is no longer needed. Instead, existing urban assemblies (such as conferences, public festival events, protest marches and working groups) harbour an energy and intensity which helps to amplify the presence and potential of small-scale interventions. Tactically making use of these opportunities has allowed my own placeless, embodied and relational practice to manipulate and divert standard trajectories of operation. When activated in a combination of ways, these opportunistic spaces enable encounters, exploration and uptake of embodied actions. While tactical urbanism is not new within landscape architecture practice it offers an essential framework within which to facilitate new relations and embodied actions through the establishment of discursive sites.

Conclusion

We cannot escape the notion, asserted by Lefebvre some fifty years ago now, that “nature is being murdered by ‘anti-nature’ – by abstraction, by signs, by images, by discourse, as also by labour and its products”[24]. Just as “nature” in this context does not allude to a type of nostalgic wilderness, the “anti-nature” is not simply technologies, tools and by-products made by humans. Rather, our own ubiquitous enmeshment with technologies and our disembodiment of space renders us Lefebvre’s anti-nature. In this networked scenario, humanity too is at stake. Since Lefebvre made this assertion, urbanisation has increased, as has the global human population and the rate of production and consumption required to perpetuate the modern urban growth and ways of life.
The four revisions discussed in this paper make room for accommodating the generative and performative force of citizen action within landscape architecture practice. Doing so simultaneously recognises the impact that the daily actions of the global population, including ourselves, are having in the environment, while also proposing and provoking counter actions.

24. Lefebvre, *The Production of Space*, 71

Moving towards an embodied practice opens to the possibility of augmenting performative relations and actions between citizens and social, economic or ecological landscape systems in ways that expose the necessity for environmental stewardship and care. These four revisions are my offering to this current situation, providing a way for landscape architects to work with citizens to instigate small but catalytic actions in urban environments towards performing changes in landscapes.

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The Need to Design the Energy Ground.

Energy Transition, Renewables, Energy Space, Space-blind Policies, Multifunctionality

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The energy transition supported by European policies is manifesting evident spatial outcomes on the territory by generating energy sprawl, increasing demand for new energy grounds, shaping new landscapes, and rooting new relationships with local contexts. This process, conceived by space-blind policies, has produced an accidental transformation of spaces, leading to new conflicts, new disparities, and new pressures on the environment. This out-of-control process is even more complicated by the speed and magnitude of change that has taken the design perspective away from many practices. In the face of so many isomorphic projects, that just fell on the ground without contextual integration, is possible to observe some practices in countertrend where the energy space integrates with the landscape, becomes multifunctional, and acquires new values in addition to the productive ones. The paper addresses the relationship between ground and energy by describing some spatial transformative trends in energy transition, but also, by raising suggestions on different

design approaches observed in some energy plants in Northeast Italy. The paper wants to raise the importance of the design of the energy ground in energy planning, as well as to reiterate the centrality of spatial issues in energy policies.

Transition to renewable energy: a new spatial question

The contemporary energy transition is a process that began in the 1970s[1], but only in recent decades is it manifesting itself in a widespread and evident way with physical outputs such as photovoltaic systems, wind farms, and small hydroelectric and bioenergy plants.

A strong impetus has been given since 2009 with the launch of binding EU energy policies. These programs have become important drivers of land use transformation, triggering a rapid process of re-territorialization of energy systems with a consequent intense modification of European landscapes[2]. The policies that guided the process initially considered the transition only in the economic and technical aspects, ignoring the spatial ones[3]. The territory was mostly conceived as a support or a site to be developed, where the localization was based on technical characteristics or for a lower visual impact[4].

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2. Jeremy Rifkin, *Un Green New Deal Globale* (Milan: Mondadori, 2019).
3. Marina Frolova, Alain Nadai, and Maria-Josè Prados, *Renewable Energies and European Landscapes: Lessons from Southern European Cases* (Cham: Springer, 2015). Matteo Girolamo Puttilli, *Geografia delle fonti rinnovabili. Energia e territorio per un'eco-ristrutturazione della società* (Milan: Franco Angeli, 2014). Gavin Bridge, Stefan Bouzarovski, and Nick Eyre, "Geographies of Energy Transition: Space, Place and the Low-Carbon Economy," *Energy Policy*, 2013.
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7. Anna Marson, "Tracce Di Bio-Regione," In *Per una città sostenibile. Quattordici voci per un Manifesto*, ed. Camilla Perrone and Michelangelo Russo (Rome: Donzelli editore, 2019).

These aspects have produced isomorphic and space neutrality policies[5] based on sectoral rather than territorial dimensions, with a top-down approach, and dependent on economic incentives and government or financial support[6].

The speed and spread with which the re-territorialization of renewables took shape has promoted the growth of de-territorialized networks, populated by stakeholders interested exclusively in maximum profit[7]. These aspects have, on the one hand, limited the experimentation of local projects as an opportunity for virtuous development[8], on the other hand, it led to a rough and undemocratic process of spatialization, setting up an image of transition out-of-control and devoid of long-term vision[9].

The problematic consequences did not take long to manifest themselves in territorial conflicts[10]. Their rapid and widespread propagation, although neglected for a long time, has emphasized the importance of

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8. Giovanni Carrosio, "La questione energetica vista dalle aree interne,"in *Riabitare l'Italia*, ed. Filippo Barbera, Fabrizio Barca, Giovanni Carrosio, Domenico Cersosimo, Antonio De Rossi, Donzelli Carmine, Arturo Lanzani, Laura Mascino, and Pier Luigi Sacco (Rome: Donzelli editore, 2018), 487–98. Magnani, *Transizione energetica e società. Temi e prospettive di analisi sociologica.* Matteo Girolamo Puttilli, *Geografia delle fonti rinnovabili. Energia e territorio per un'eco-ristrutturazione della società.* Martin Pasqualetti, "The Geography of Energy and the Wealth of the World," *Annals of The Association of American Geographers* - Ann Assn Amer Geogr 101 (July 2011): 971–80.

9. Maurizio Carta, *Futuro* (Soveria Mannelli: Rubbettino editore, 2019). Carlo Gasparrini, "La metamorfosi resiliente della città" in *Per una città sostenibile. Quattordici voci per un Manifesto*, ed. Camilla Perrone and Michelangelo Russo (Rome: Donzelli editore, 2019), 133–41.
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10. Martin Pasqualetti, "Social Barriers to Renewable Energy Landscapes," *Geographical Review*, 2011. Fabrizio D'Angelo, "Progettare i Territori Marginali Della Transizione Energetica: Alcune riflessioni su buone e cattive pratiche a partire dalle vicende del 'mini' idroelettrico sul Piave," in *Le politiche regionali, la coesione, le aree interne e marginali,* Planum (2021).
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socio-spatial issues of energy, and underlined how unresolved conflicts are important constraints to the transition[11]. Now it is clear how the energy transition needs to pay attention to its spatial issues and, therefore, a resumption of control is urgent both in actions and visions. In urban studies, the broader debate remains linked to the problems of energy supply and efficiency of buildings and mobility[12], but still little has been explored on the relationships between production/distribution/consumption of energy and territorial issues. Is so necessary to re-establish links between energy systems and territories with integrative interventions, thinking of hybrid functions and multifunctional spaces[13], and with local roots in harmony with the environment and communities[14].

Materials and methods

The paper was written in 2021 collecting some reflections from a PhD thesis in Urbanism entitled "Territorializing the energy transition"[15]. The thesis explored the spatial issues of the energy transition starting from the case study of Veneto, a paradigmatic territory of the Italian energy transition. The object of the research was to read and interpret the territorial impacts of the transition by looking at the systems of production, transportation, and trough a socio-spatial

12. Paolo Pascali and Annamaria Bagaini, "Energy Transition and Urban Planning for Local Development. A Critical Review of the Evolution of Integrated Spatial and Energy Planning," Energies 12 (December 2018): 35. Stoeglehner, Niemetz, and Kettl, "Spatial Dimensions of Sustainable Energy Systems: New Visions for Integrated Spatial and Energy Planning," *Energy, Sustainability and Society* 1 (November 1, 2011).

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lens. The reflections in this paper are the first result of the fieldwork that took place both in the territory of investigation (Veneto) and in surrounding contexts (Northeast of Italy). During these explorations, it was possible to take a close look at several energy plants (especially photovoltaic and mini hydroelectric) to examine their spatial characteristics, but also the dynamics that animate the landscapes in which they are embedded. Following the explorations, some insights were pursued through information retrieval, often through the grey literature of the local newspaper and blogs, and through the systematization of information gathered from informal interviews in the field. This paper tries to reflect on some countertrend design practices and configuration of space that seem interesting to renew references and project tools on the energy transition. The aim is thus to systematize and share some suggestions to stimulate different design approaches, helping to feed the debate on territorialized transition design.

Current trends in energy spatial transformation

The search for energy has always changed the territory, but for a long time, we have not been fully aware of it[16]. The advent of fossil fuels, electricity, and power grids has compromised the centuries-old localization link between energy production and consumption, in fact, most energy systems were configured in remote regions or marginal contexts[17]. This situation is changing in the current transition where a process of restructuring of energy systems is being carried out toward distributed, diversified, and decentralized production, which is based, in large part, on the exploitation of renewable energy sources. The possibility to produce energy almost everywhere has

16. Martin Pasqualetti and Sven Stremke, "Energy Landscapes in a Crowded World: A First Typology of Origins and Expressions," E*nergy Research & Social Science* 36 (2018): 94–105.
17. Termini, *Energia. La grande trasformazione* (Rome: Laterza, 2020).
18. Trainor et. Al. in Frolova et al., "Effects of Renewable Energy on Landscape in Europe: Comparison of Hydro, Wind, Solar, Bio-, Geothermal and Infrastructure Energy Landscapes."

distributed many small and medium-sized plants throughout the territory, generating what could be called the energy sprawl[18]. These new plants could be directly connected to the distribution grid, changing the energy network, now based on a flexible, bidirectional, and bottom-up manageable system. From a spatial perspective, this new system has considerably complexified the territory, spreading new physical objects such as wind turbines, photovoltaic or solar panels, and biogas plants and giving new spatial configurations with practices such as, for example, the cultivation of agro-energy crops or the short forestry system for biomass production.

A second significant trend is an increased need for space. Production from renewable sources, compared to fossil fuels, has a lower energy density per km², that is, to produce the same MW of energy as before, renewables need much more physical space, both as space to place the plant, and as a space to extract resources[19]. Renewable resources, therefore, have a wide land-use footprint whose characteristics depend on the technology and energy source used.

A third trend arises from the combination of different technologies with the use of various resources and the physical components of a context that generates a high variety of new energy landscapes. Each production system produces many different spatial outcomes depending on the characteristics of the context (environmental, demographic, cultural, socio-economic), the urban form and function, the scale, and the methodology undertaken in the plant project[20]. Each landscape is characterized both by the presence of plants that can occur in different components, layers, and entities[21] and by the

19. Frolova et al. "Effects of Renewable Energy on Landscape in Europe: Comparison of Hydro, Wind, Solar, Bio-, Geothermal and Infrastructure Energy Landscapes."; Pasqualetti and Stremke, "Energy Landscapes in a Crowded World: A First Typology of Origins and Expressions."

20. Ilse Voskamp Nora Sutton, Sven Stremke, and Huub Rijnaarts, "A Systematic Review of Factors Influencing Spatiotemporal Variability in Urban Water and Energy Consumption," *Journal of Cleaner Production* 256 (2020): 120310.

21. Pasqualetti and Stremke, "Energy Landscapes in a Crowded World: A First Typology of Origins and Expressions."

22. Magnaghi, *Il principio territoriale*.

configuration, extraction, processing, or transport of a resource.
The last trend is the reconstruction of the local energy link. In the past, as already mentioned, energy systems were perceivable only in remote sites and their functioning was considered by few people. With the ongoing transition, this situation has been reversed: all people become aware of new contextual knowledge and relate to new energy dynamics[22]. For example, it is now possible to observe, often in the places where we live, the functioning and spatial configuration of energy plants or become owners and builders of energy self-production systems. The crisis of the centralized system and a return to forms of local resource

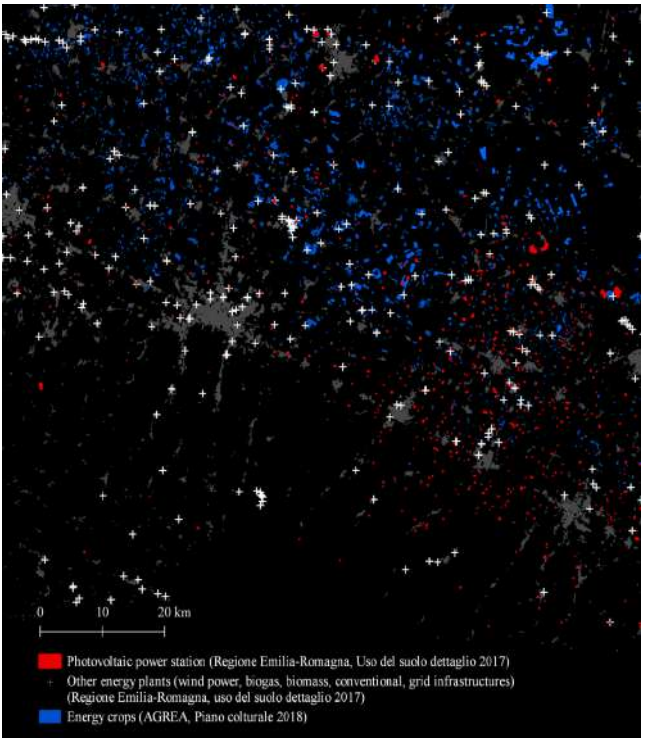

Fig. 01

The energy ground map (eastern Emilia-Romagna clip). A photovoltaic power station (red polygons), energy crops (blue polygons), other energy plants such as wind turbines, biogas and biomass plants, and grid infrastructures (white cross). Cartographic references: Regione Emilia-Romagna, uso del suolo dettaglio, 2017; AGREA, Piano colturale, 2018. Credits: Fabrizio D'Angelo, 2021

23. Paolo De Pascali, *Città ed energia. La valenza energetica dell'organizzazione insediativa* (Milan: Franco Angeli, 2008).
Osorio Aravena, Juan, Marina Frolova, Julio Terrados, and Emilio Muñoz-Cerón, "Spatial Energy Planning: A Review," *Energies* 13 (October 2020).

management have re-established the historical links between energy and the socio-economic and technological development of the territory[23].
In these four energy-spatial trends, the ground is involved both as a change in land use and as a reconfiguration of space. The most widespread change in land use is that of agricultural spaces: photovoltaics and wind farms immediately took place on cropland, replacing unprofitable crops (often in unspecialized agricultural areas), generating conflicts on land use and production systems (food vs energy). If the aspects of the land occupation of the plants are more evident and representable, those related to the transformations of spaces of the entire production system are less so. An energy system has its metabolism that works by phases of input (extraction and configuration of the resource), processing (energy production), and output (waste management and energy transport). In each of these phases, the ground is subject to transformations, not only on the surface but in all the ecological sections: for example, a biogas plant often "digests" products specifically grown for energy purposes, and the production waste (digestate) is used to fertilize the cropland; or the hydroelectric production, taking water from natural rivers, produces changes on a large environmental space.

Different energy ground designs: some examples from northeast Italy

From the previous paragraphs, it emerges the importance of the spatial issues of the energy transition but remains little explored the design dimension of these spaces. Even today, many systems are built with isomorphic projects, with common technical solutions adaptable to each site, without considering that that site is part of a context with a set of related territorial issues. For example, is not considered the future of these energy spaces (renewable technologies often last thirty years) or the environmental aspects through a metabolism perspective; are less considerate also the local issues ranging from relations with the socio-economic context, to the requests and potentialities expressed by stakeholders, to the characteristics of the landscape, to the cultural aspects, and to the existing

different territorial uses.
Despite this critical framework, some opposite trends show different and new design explorations. This is the case of some examples observed during the fieldwork of a Ph.D research. In the eterogeneous eange of energy projects it is possible to list four different design approaches: agro-energy multifunctional spaces; brownfield re-functionalization; re-use of existing territorial infrastructure; and integration of spaces for ecological functions and activities related to leisure, education, and tourism.
The first design approach is the one that integrates energy production with agricultural ones. This is the case of the large photovoltaic plant installed above a meadow pasture in Sant'Alberto di Ravenna where the elevation of the panels from the ground (more than 1,5 meters) and the installation of structures, without the use of reinforced concrete foundations, allow the growth of lawn grasses and the free graze of the flocks of the local farm. Another example is the agro-voltaic plant in Borgo Virgilio (Mantua) where many rows of photovoltaic panels, 12 meters apart, were installed suspended above the crops, creating a porous grid that allows the passage of light and rain (above), and the passage of agricultural vehicles and the cultivation of arable land, vegetables, fruit, and ornamental plants (below).
In the second design approach, it can be observed the re-functionalization of brownfields which, being contaminated, compromised, or useless, often struggle to find new uses. Some examples are the photovoltaic systems installed in the former mining area of San Niccolò on the outskirts of Bologna; the former landfills of Casaglia (Ferrara) and Goro (Po

Fig. 02

New small hydro plant in a former mill in the village of Pinadello (Treviso). Credits: Fabrizio D'Angelo, 2021

Delta), both areas awaiting environmental remediation; the former NATO military bases in Zelo (Rovigo) and in Mount Calarvina (Verona), or in the former barracks of Spilimbergo (Pordenone) and Cà Turcata (Venice), where a large amount of transformed surfaces could be use in new cycle of energy production.

The third design approach shows the possibility to integrate energy devices into existing territorial infrastructures. This is the case observed in many mini hydroelectric plants installed along the irrigation canals of the Consorzio di Bonifica del Piave or those installed on the former canals and derivations of ancient mills and factories along the Meschio river (Treviso); and again, the photovoltaic panels installed along with the barriers of the A22 highway close to the village of Isera (Trento) or those installed along with the barriers of the industrial zone of Tesero (Trento).

The fourth design approach is introduced by projects that restore, preserve, or enhance the local environmental aspects. An interesting example is the photovoltaic farm of via Aravena in Ferrara where on the perimeter of the plant has been restored a little basin called locally "macero"[24] (point of interest for the local ecological network) and have been planted rural hedges to mitigate and complexify the surrounding landscape, otherwise characterized by the flatness typical of agro-industrial landscapes. Another example is the case of the wind power plant on Mount Mesa in Rivoli Veronese (Verona), where has been carried out a careful project to preserve and increase the vegetation of the arid meadows of the hilly ridge, part of a Site of Community Importance-SCI. Here, the soil excavated to build the wind turbine foundations was preserved, as were the bulbs of protected floristic species to then reconstruct the ecological section of the site.

The last approach observed is the integration of leisure and didactic-educational function in the ground of the energy plant. The re-functionalization of the old Altanon hydroelectric plant (1905-1967) in the Dolomites (Belluno), allowed the recovery of a historic

24. The macero is a water basin that was used for the processing of hemp, have a rectangular shape and a variable depth. Ecologically, they can have three zones: aquatic, shore, arboreal-shrubby.

Fig. 03

Spaces with ecosystem function inside a photovoltaic power plant close to Ferrara industrial area. Credits: Fabrizio D'Angelo, 2021

infrastructure as well as a landscape that had been abandoned for decades. The location of the plant, at the border of the Dolomiti Bellunesi National Park, provided an opportunity to recover spaces and architecture also for leisure accessibility: the guardian house was transformed into a hostel, while the spaces around the power plant were equipped for leisure-related activities. In the surroundings, an environmental-energy path starts from the plant and, following the route of the pipelines, gets to the little dam in the river. Along this path, different panels explain the linkage between water, energy, and the environment, becoming an interesting educational tool. Another example is the PEPER park in Badia Calavena (Verona) where the installation of a large wind turbine on the top of a hill led also create a tourist itinerary that enhances the local landscape and spreads awareness on energy renewable transition.

Toward a multifunctional concept of energy ground

In the examples shown, a certain tendency towards integration and territorial rooting of energy infrastructures emerges.
In the first design approach, the examples show mediating solutions in the competition in land use between agricultural and energy production that often generates conflicts. As illustrated in the second case,

25. Toledo and Scognamiglio, "Agrivoltaic Systems Design and Assessment: A Critical Review, and a Descriptive Model towards a Sustainable Landscape Vision (Three-Dimensional Agrivoltaic Patterns)."

these integrations can ensure new bioclimatic conditions in favour of agriculture, such as semi-shading, that in some cases improves the conditions of crop products and soil[25].

In the second, the cases show possible solutions for re-functionalizing the many brownfield spaces that often do not find easy recovery design solutions. In these examples, attention to the transitoriness of the energy function emerges; in fact, many of these facilities have provided for non-invasive ground connections, thus allowing for future reclamation of the site once it has been decontaminated, or regenerated.

In the third design approach, the solutions illustrated have a threefold benefit: they reduce the consumption of land and construction materials (it is possible to use existing site configurations such as routes, mineral surfaces, weirs etc.); they reduce the impact on the environment (e.g. often mini-hydro plants are installed on small natural streams, while in the observed cases they fall into existing hydraulic infrastructure where the ecological value is less); and, lastly, they can ensure the recovery of historical artefacts, such as ancient water mills or old factories, which guarantee the preservation of the local historical heritage.

In all these design solutions the space is open to different functions and accessibility, and elements of the local context are enhanced (historical infrastructures, ecosystems, local crops etc). These approaches suggest a new design culture that focuses on the idea of the multifunctionality of the space. This concept has been consolidated within the debate on agriculture since the 1990s: with the introduction of agri-environmental measures, it was pointed out how economic activity can have different outputs and it

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26. Ferrario, "Lo spazio agrario nel progetto di un territorio. trasformazioni dei paesaggi rurali nella pianura e nella montagna veneta."
27. Pim Kupers, Pieter Schengenga, Taco Kuijers, and Boris Hocks, "MeerWaarde Met Duurzame Energieopwek," *Landschap* 36, 4 (2019): 207–12.
28. Paola Vigano, Lorenzo Fabian, and Emanuel Giannotti, *Element for a Theory of the City as Renewable Resource. A Design and Research Programme (*Pordenone: Giavedoni editore, 2012).

Fig. 04

Sharing the infrastructure space: photovoltaic panels installed in the industrial basin of an irrigation system in Solarolo (Ravenna). Credits: Fabrizio D'Angelo, 2021

can contribute to several social targets in one[26]. The multi-functionality allows, besides defining its function, to interpret differently not only the productive activity, but also the structure of the space and its territorial role, and, if applied to planning, it can have revolutionary effects that bring to a concept of multifunctional land use[27]. This reconceptualization finds an interesting application to the spaces of energy systems. The energy space does not be exclusive and inaccessible, but it could integrate and merges with the territorial context, giving the possibility to customize, or rather characterize, the space according to various design practices and enhance dynamics and elements already present in the territory. This aspect is particularly linked to a typical trend of the current transition: the energy sprawl. The request for spaces and the fragmentation of the interventions imposes a certain coexistence and integration with what already exists and what has been produced in the different life cycles of the territorial process[28]. This different idea of spatial design is an opportunity to combine, according to Magnaghi (2020), the natural capital (soil, sun, air, forests, rivers, lakes, etc.) with the territorial capital (cities, monuments, infrastructures, agroforestry systems, urban and rural landscapes, etc.). The lack of spatial design experimentations and strong visions have led to critical situations with an impact also on urban planning. Multifunctionality, if properly designed, understood, and stimulated by both energy and land-use policies, would alleviate, or even could solve, many criticalities related to social acceptance, spatial justice, exlusive and speculative use of energy

resources, and land consumption and transformation. These considerations, are mere field observations that, while lacking critical and in-depth case-by-case rereading, are intended to suggest and stimulate some possible design speculations. Broadly, the paper suggest a different focus on the energy transition that puts the need to design the energy ground among the primary goals on energy and urban policies, for a new design culture able to spread spatial quality and justice.

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Caring for Infrastructural Grounds. A Research Agenda.

Infrastructure; Logistics; Infrastructural turn; Urbanism; Exploitation.

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Over the last 20 years, the infrastructural networks emerging from globalization have shaped new forms of urbanity, changed the fabric of the city, and revolutionized the spatial organization of ever-larger areas of the globe. These new infrastructural grounds merit greater attention and in-depth understanding through detailed descriptions. Hence, the following contribution illustrates three key categories of contemporary infrastructural grounds: grounds of storage, grounds of exploitation, and grounds of regulation. Each is explored by examining a representative space: Khorgas Gateway, on the border between China and Kazakhstan; Bayan Obo, in the Goby Desert; and the Sino-Singapore Tianjin Eco-City, in the Jing-Jin-Ji urban agglomeration. These become objects of study, as well as specific viewpoints that highlight the need to engage with contemporary infrastructural grounds through critical theory and design activities.

Introduction

On March 23rd, 2021, a 400-meter long and 46-meter-wide cargo ship blocked the Suez Canal. Within a few hours, a major global trading route had turned into a planetary bottleneck: more than 300 cargo ships halted, and shipping companies had to hurriedly rearrange their routes, provoking an 8% bump in crude oil prices. With the media emphasizing the fragility of global supply chains, few paid much attention to the ground where this accident occurred. Despite its image, the Suez Canal is not just a water corridor, but one of "the new world capitals:"[2] 12% of global trade passes through here; and even though the entire area is inhabited by only 750,000 people, the establishment of the Suez Canal Economic Zone in 2002 foresaw the development of 461 square kilometers as home to two industrial and logistics sites, two new towns and four ports[3]. Hence, what, until the mid-19th century, was barren desert is now turning into an urbanized infrastructure: a mix of human-generated technologies, housing developments, domesticated landscapes, and

Fig. 01

Suez Canal Traffic Jam. Credit: ESA, Copernicus Sentinel data

1. Julian Lee, "What a Long Suez Canal Closure Means for the Oil Price," *Bloomberg*, 25 March 2021, https://www.bloomberg.com/opinion/articles/2021-03-25/suez-canal-blocked-what-a-lengthy-closure-will-mean-for-the-oil-price.
2. Kagkuo Renia and Nikos Katsikis, "The New World Capitals," *Domus* 1037 (August 2019): 752.
3. General Authority for Suez Canal Economic Zone, *The Suez Canal Economic Zone* (Suez: General Authority for Suez Canal Economic Zone, September 2016).

ecological reserves.
While the same might be true for most of the Earth's surface, the radical effects of such transformations are most evident in new infrastructural grounds such as the Suez Canal. Thus, these spaces have drawn the attention of many scholars in the field of urban studies. The majority regard infrastructural grounds as the result of global capitalism and neoliberal policies: theatres of environmental violence, labor exploitation, and stark inequalities[4]. This would be more than enough to spark a debate on the reconceptualization and redesign of these spaces, but there is a further key point to consider: infrastructural grounds demand constant care. Owing to rapid technological obsolescence, economic disruption, catastrophic climate changes, and other external shocks, these places need continual readaptation to meet ever more demanding ecological, financial, and socio-political requirements[5]. Again, the Suez Canal is emblematic in this sense, and this does not only refer to the constant maintenance required to keep global trade flowing, but the ongoing construction of new grounds to accommodate free economic zones, spaces for production and logistics, and a new heterogeneous population made up of a low-paid labor force, rich businesspeople, and wealthy tourists. This need for constant care, while problematic to some extent, can also be considered as a stimulus for envisioning new design approaches. For instance, could infrastructural grounds be remodeled as inclusive spaces? Could they be envisioned as sites for new socio-environmental relations? And are there ways to care for infrastructural grounds, while avoiding a merely techno-managerial restructuring "aimed at reinforcing

4. For instance: Nikhil Anand, Akhil Gupta, and Hannah Appel, *The Promise of Infrastructure* (Durham: Duke University Press, 2018); Keller Easterling, *Medium Design: Knowing How to Work on the World* (London: Verso Books, 2021); Erik Swyngedouw, "More-than-Human Constellations as Immuno-Biopolitical Fantasy in the Urbicene," *New Geographies* 9 (2017): 20-27.
5. Christopher R. Henke and Benjamin Sims, *Repairing Infrastructures. The Maintenance of Materiality and Power* (Cambridge, Massachusetts: MIT Press, 2020); Jérôme Denis and Daniel Florentin, "Urban Infrastructures' Maturity and the Age of Maintenance," in *Handbook on Infrastructures and Cities* eds. Olivier Coutard and Daniel Florentin (Camberley and Northampton: Edward Elgar Publishing, forthcoming), n.d.
6. Swyngedouw, "More-than-Human Constellations as Immuno-Biopolitical Fantasy in the Urbicene," 20.

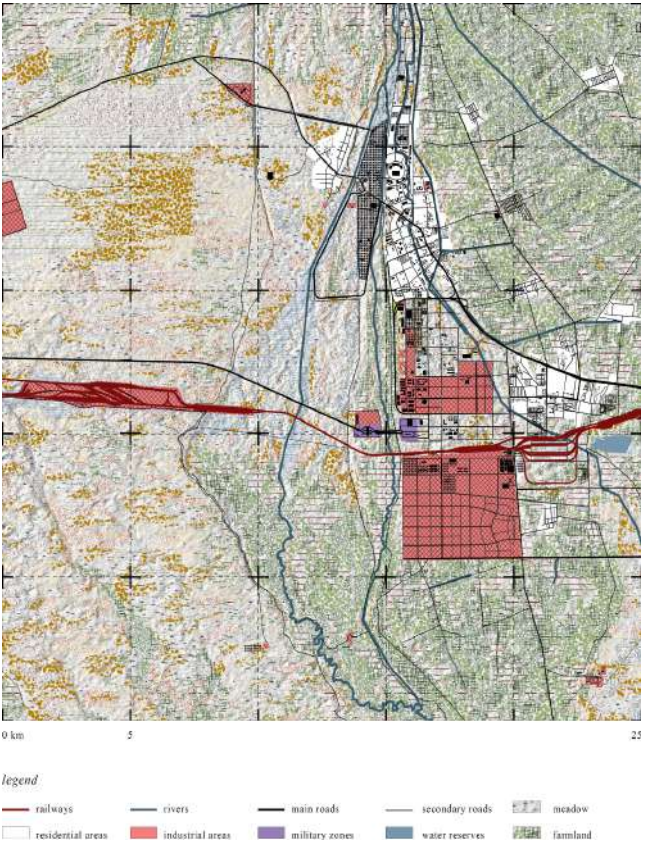
the body politic against threatening outsiders ... so that life as we know it can go on?"[6]
To address these questions, the first step is to depict the new infrastructural grounds. These are still lumped together regardless of their specificities; instead, their exploration and description are vitally important. Consequently, this contribution highlights the heterogeneity of such spaces, sited in extremely variegated contexts as a response to diverse needs. It focuses on three types of infrastructural grounds: grounds of storage, grounds of exploitation, and grounds of regulation. These become objects of study as well as specific viewpoints from which to discuss the issues, needs and possibilities of contemporary infrastructural grounds.

Grounds of storage

Similar to the Suez Canal Economic Zone, in 2014 a cooperation agreement between China and Kazakhstan was sealed to build a new Dubai: Khorgas Gateway[7]. This has turned a stretch of the Taklamakan desert, 2,500 kilometers from the nearest sea, into the largest dry port in the world. Huge terminals handling up to 18,000 containers a day have appeared on each side of the border, with gigantic cranes for conveying containers onto two national rail systems operating on different track gauges. In addition, an area of 10,000 square meters is dedicated to container storage. Khorgas Gateway is, however, intended to be more than just a ground for the movement of goods. Next to the container area is the Khorgas International Center for Border Cooperation, that is, a Special Economic Zone (SEZ) consisting of 608.56 hectares cleared to host large-scale factories, massive malls, universities, amusement parks, golf clubs, and business centers. Moreover, the overall plan for Khorgas encompasses

7. Marcelo Duhalde, Adolfo Arranz, and Marco Hernandez, "Belt and Road Initiative," *South China Morning Post*, June, 18 2019, http://multimedia.scmp.com/news/china/article/One-Belt-One-Road/khorgos.html; Ben Mauk and Andrea Frazzetta, "Can China Turn the Middle of Nowhere into the Center of the World Economy?," *The New York Times*, January 29, 2019, https://www.nytimes.com/interactive/2019/01/29/magazine/china-globalization-kazakhstan.html.

Fig. 02
Khorgas Gateway.
Credits: Leonardo
Ramondetti



Nurkent: a new town offering housing, schools, kindergartens, shops, and all the facilities required to make the dry port work properly. As declared by the CEO of Khorgas Gateway, this 'middle of nowhere' will soon become the main oasis of global trade[8]. Like logistics zones worldwide, Khorgas Gateway reveals

8. Wade Shepard, "Khorgos: The New Silk Road's Central Station Comes to Life," *Forbes*, February 20, 2017, https://www.forbes.com/sites/wadeshepard/2017/02/20/khorgos-the-new-silk-roads-central-station-comes-to-life/; Andrew Higgins, "China's Ambitious New 'Port': Landlocked Kazakhstan," *The New York Times*, January 1, 2018, https://www.nytimes.com/2018/01/01/world/asia/china-kazakhstan-silk-road.html; Khorgos ICBC Authority, *Investing in Khorgos. International Center for Border Cooperation*, (Khorgos: Khorgos ICBC, 2018).

how infrastructural spaces are redefining their status. Even in the late 1990s, these were merely technical enclaves all over the world to integrate the global economy[9]. On the contrary, today, they are fully-fledged cities that include an ever-wider range of activities and can accommodate a myriad of uses. A 3D virtual tour of Khorgas Gateway reveals this new condition[10]. The plots of land range from 300x300 to 500x500 meters, have access to roads and come ready-equipped with utilities such as, electricity, water, sewerage, fiber optic network, internet connection, and 24-hour security. Inside, each area is completely customizable, and it can be freely used as an industrial zone, a warehouse, for tertiary activities, or even residential purposes. However, despite their new status, these grounds of storage are still designed to be nothing more than "backup space[s] available to be used when necessary:"[11] they are enclosed areas, within which a standardized infrastructural grid acts as a motherboard, storing and supporting the correct functioning of different programs which rarely interface with one another. This simplified blueprint is now applied everywhere: from the Murmansk Economic Zone above the Arctic Circle to the Tierra del Fuego Free Trade Zone in southern Argentina. Engaging critically with these grounds of storage means envisaging these spaces differently, reorganizing such an urbanism-on-demand, and ensuring these zones do not become decoupled from their surroundings.

Grounds of exploitation

1,500 kilometers south-west of Khorgas is Kabul. Here, the withdrawal of NATO forces and the return of the Taliban raised widespread concern in the West. While the main issue is the social, humanitarian, and

9. Neil Brenner, "Between Fixity and Motion: Accumulation, Territorial Organization and the Historical Geography of Spatial Scales," *Environment and Planning D: Society and Space* 16, no. 4 (1998): 459-81.
10. Khorgos ICBC Authority, "Khorgos 3D-Tour," Khorgos ICBC Authority, accessed September 10, 2021. https://khorgos.kz/3-d-tour/?lang=en.
11. Angelo Sampieri, "The City is Available. Chinese New Towns as a Backup sSpace," in *The City after Chinese New Towns. Spaces and imaginaries from contemporary urban China*, ed. Michele Bonino et al. (Basel and Boston: Birkhäuser, 2019), 210-11.

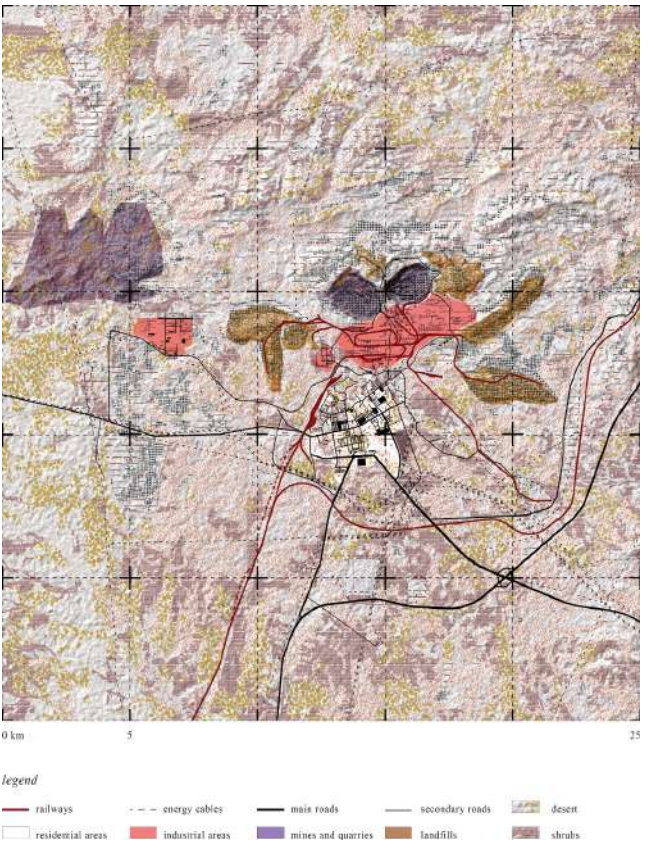


Fig. 03
Bayan Obo.
Credits: Leonardo Ramondetti

democratic future of the country, there is also the question of the at-least-one-trillion dollars' worth of unexploited mineral deposits, particularly lithium, copper and, above all, rare-earths. For the last, China is eager to retain its near monopoly thanks to Bayan Obo: the largest mine in the world. Located in Inner Mongolia, this highly developed mining industry has turned 200 square kilometers of the Gobi Desert into a production site replete with roads and railways as

12. Pui-Kwan Tse, "China's Rare-Earth Industry," *U.S. Geological Survey*, 2011, https://pubs.usgs.gov/of/2011/1042; Marc Humphries, *Rare Earth Elements: The Global Supply Chain*, (Darby: Diane Publishing, 2010); Yasuo Kanazawa and Masaharu Kamitani, "Rare Earth Minerals and Resources in the World," *Journal of Alloys and Compounds* 408 (2006): 1339-43.

well as towns that house about 30,000 inhabitants. In other words, a branch of the ever-widening circuit of commodity exchange[12].

Bayan Obo is only one of the many remote areas of the world which have recently been integrated into the global supply chain. The deserts and forests of Latin America are exploited to the point that raw materials and energy exceed 60% of total exports in Chile, Colombia, and Peru[13]. It is not just mining and power production, but also the Plantationocene[14]: extensive cultivations of soy and corn farms in the American Midwest, massive palm oil plantations in Malaysia, expanses of tomato greenhouses in Almeria, and many others all over the planet[15].

These are all grounds of exploitation resulting from trade liberalization and new infrastructural networks that ensure cost-effective access to every market. Such conditions turn the landscape into a fungible asset, allowing the segmentation of production and its horizontal spread to exploit every location on the basis of the best performance it can offer[16].

Engaging with grounds of exploitation means being aware that, in bringing about economic optimization, such development also raises environmental and social concerns. The ecological footprint of the grounds of exploitation is gigantic. For instance, as documented by Martín Arboleda[17], large scale mining sites require between 460 and 1,060 liters of water per gram of mineral and produce between 50 and 140 million tons of solid waste per year. Their total

13. Martín Arboleda, "Spaces of Extraction, Metropolitan Explosions: Planetary Urbanization and the Commodity Boom in Latin America," *International Journal of Urban and Regional Research* 40, no. 1 (2016): 96-112.

14. The term was collectively coined by the participants to a seminar for *Ethnos* at the University of Aarhus in October 2014. See Donna Haraway, "Anthropocene, Capitalocene, Plantationocene, Chthulucene: Making Kin," *Environmental Humanities* 6, no. 1 (May 2015): 159–65.

15. See respectively: Neil Brenner and Nikos Katsikis, "Operational Landscapes: Hinterlands of the Capitalocene," *Architectural Design* 90, no. 1 (2020): 22-31; Géraud Bablon et al., "Stop this," *Domus* 1038 (September 2019): 856-61; Keller Easterling, "Tomato World," *PRAXIS: Journal of Writing + Building*, no. 4 (2002): 116-23.

16. Ronald W. Jones and Henryk Kierzkowski, "Horizontal Aspects of Vertical Fragmentation," in *Global Production and Trade in East Asia*, eds. Leonard Kwok-Hon Cheng and Henryk Kierzkowski (Basel: Springer, 2001), 33-51; Kieran P. Donaghy, "Urban Environmental Imprints after Globalization," *Regional Environmental Change* 12, no. 2 (2012): 395-405.

17. Martin Arboleda, *Planetary Mine: Territories of Extraction Under Late Capitalism* (Brooklyn: Verso Books, 2020).

emissions are, on average, 40% greater than any megacity in the global South. Moreover, the impact of mining and monoculture farming on these lands makes their reclamation nearly impossible. Finally, most of these activities rely on low-paid migrant workers, leading to local communities' displacement. Within this picture, design activities cannot be confined to remedial actions or reclamation, but must rethink the organization of these spaces and consider them as more than just sites to be plundered.

Grounds of regulation

Raw materials, such as rare-earth minerals, lithium, and copper, have gained increasing importance because of the global green-energy transition. However, just as critical are the rules for regulating the new infrastructural realm, which increasingly affects how the space is modelled and lived. A case in point is the Sino-Singapore Tianjin Eco-City (SSTEC): a model for the sustainable metropolis of the 21st century. The plan, drafted in 2009, envisages the urbanization of 30 square kilometers over the next 15 years to be home to 350,000 inhabitants. Here, green spaces account for more than 50% of the total surface, solar panels should provide 60% of the energy, and a huge 150,000-ton treatment plant can purify blackwater and clean up to 50% of graywater[18]. Aside from the technical devices to be adopted, the success of this pilot project relies on the rules and the standards outlined in the Eco-City Assessment and Best Practices Program established by the Ministry of Housing and Urban-Rural Development[19]. This includes the 61 performance indicators on the basis of which the China Academy of Urban Planning and Design designed the ‘eco-cell’: a precise urban

18. Wade Shepard, *Ghost Cities of China: The Story of Cities without People in the World’s Most Populated Country* (London: Zed Books, 2015).
19. Axel Baeumler, Ede Ijjasz-Vasquez, and Shomik Mehndiratta, *Sustainable Low-Carbon City Development in China* (Washington: World Bank Publications, 2012).
20. Wu Deng and Ali Cheshmehzangi, *Eco-development in China: Cities, Communities and Buildings*, (London: Palgrave Macmillan, 2019); Austin Williams, *China’s Urban Revolution: Understanding Chinese Eco-Cities* (New York: Bloomsbury Academic, 2017).

layout that establishes functional, dimensional and density criteria for building eco-cities anywhere[20]. Today, standards, rules, and indicators such as those set out for the SSTEC are influential grounds of regulation. These sets of rules (i.e., SEED, LEED and ISO 37120) are anything but ephemeral: they define each and every infrastructure, establishing "an extensive yet mundane and, to now, rather silent force of social rationalization across the globe."[21] To make this possible, the space and its components are reduced to a set of measurable, reproducible, and manageable variables. Perfect examples of such datafication are the recent techniques of space

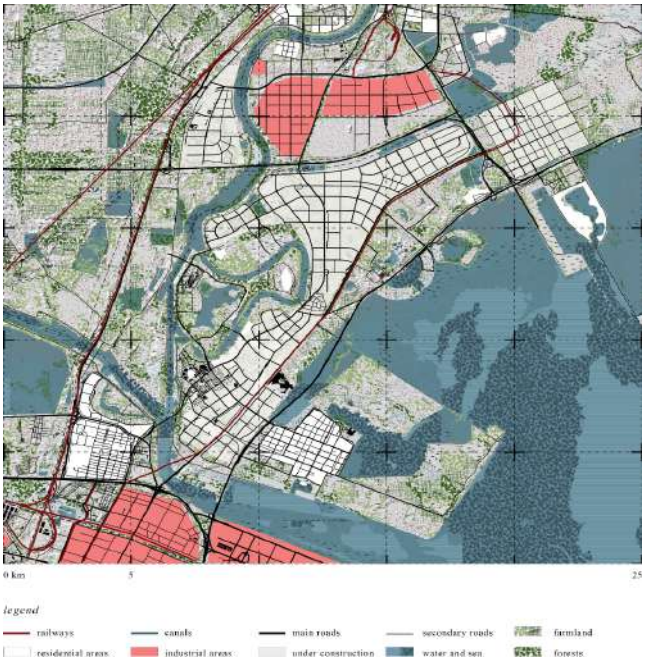


Fig. 04
Sino-Singapore Tianjin Eco-City. Credits: Leonardo Ramondetti

21. Peter Mendel, "The Making and Expansion of International Management Standards: The Global Diffusion of ISO 9000 Quality Management Certificates," in *Globalization and Organization: World Society and Organizational Change*, eds. Gili S. Drori, John W. Meyer and Hokyu Hwang (Oxford: OUP Oxford, 2006), 162-63.
22. Bradley E. Cantrell and Justine Holzman, *Responsive Landscapes: Strategies for Responsive Technologies in Landscape Architecture*, (London: Routledge, 2017); Antoine Picon and Carlo Ratti, "Everything Becomes Data," *Domus* 1039 (October 2019): 1000-1005; Eran Ben-Joseph, *The Code of the City: Standards and the Hidden Language of Place Making* (Cambridge, Mass: Mit Press, 2005).

matrix, mixed-use index, and space syntax, as well as, the extensive usage of responsive technologies, and the establishment of global city indicators to perform computational analyses of city performance.[22]
The resulting dissolution of material forms into information flows, not only reduces urban complexity, but "make[s] ownership of the city available to those who can pay for the data."[23] In a contemporary neo-liberal context, where public infrastructural systems are splintered into 'premium networked spaces' customized to the needs of the most powerful users, this turns standards into a means of enclosing spaces, reinforcing discrimination and restricting practices[24]. Thus, engaging with grounds of regulation signifies regarding design activities and everyday practices as an opportunity to constantly challenge and negotiate the status of the infrastructural grounds and the established body of rules.

Concluding remarks: infrastructural grounds as complex spaces to care for

The cases presented in the previous sections highlight how contemporary infrastructural grounds are disputed terrains, subjected to constant negotiations and appropriations. While these conditions are widely discussed in contemporary urban studies[25], there is still the need to address these issues through design. Urbanists and architects

23. Easterling, *Medium Design: Knowing How to Work on the World*, 71.
24. Stephen Graham and Simon Marvin, *Splintering Urbanism: Networked Infrastructures, Technological Mobilities and the Urban Condition* (London: Routledge, 2001); Olivier Coutard and Jonathan Rutherford, *Beyond the Networked City: Infrastructure Reconfigurations and Urban Change in the North and South* (London and New York: Routledge, 2015).
25. Anand, Gupta, and Appel, *The Promise of Infrastructure*; Stephen Graham and Colin McFarlane, *Infrastructural Lives: Urban Infrastructure in Context* (Routledge, 2014); Colin McFarlane and Jonathan Rutherford, "Political Infrastructures: Governing and Experiencing the Fabric of the City," *International Journal of Urban and Regional Research* 32, no. 2 (2008): 363-74; Jago Dodson, "The Global Infrastructure Turn and Urban Practice," *Urban Policy and Research* 35, no. 1 (2017): 87-92.
26. Hélène Frichot et al., *Infrastructural Love: Caring for our Architectural Support Systems* (Basel: Birkhäuser, 2022); Jesse LeCavalier, *The Rule of Logistics: Walmart and the Architecture of Fulfillment*, (Minneapolis and London: University of Minnesota Press, 2016); Clare Lyster, *Learning from Logistics. How Networks Change Our Cities* (Basel and Berlin: Birkhäuser, 2016); Easterling, *Medium Design*.

are crucial for engaging the materiality of the space of flows and challenging the controversial spatial connotations of the infrastructural grounds. Recent works by Hélène Frichot et al., Jesse LeCavalier, Clare Lister, and Keller Easterling turn the spotlight on this issue[26]. This body of studies has superseded the previous landscape urbanism approach to infrastructure[27], although it still lacks urban design practices. Not only is this caused by the complexity of contemporary infrastructural realms, which require the engagement of multiple disciplines and expertise; but also by the prevalence of a technocentric perspective that considers infrastructure primarily as belonging to the engineering domain. This perspective still regards each network in se, since its primary objectives are: optimizing resources, improving efficiency, and eventually establishing universal standards. Conversely, in pursuing a deeper engagement with the infrastructures, their externalities, and the spatialities they generate, what emerges is their role in the production of complex urbanities. With respect to this relational understanding, the importance of design as a speculative practice cannot be neglected. New infrastructural grounds have to be approached as an opportunity to challenge consolidated norms, question contemporary ways of production, and address today's socio-economic challenges. This requires what Hélène Frichot et al. term 'poetic

27. I refer to studies developed in the field of landscape urbanism such as: Alan Berger, *Drosscape: Wasting Land in Urban America* (New York: Princeton Architectural Press, 2007); Pierre Belanger, *Landscape as Infrastructure: A Base Primer* (Abingdon; New York: Routledge, 2016); James Corner, *Recovering Landscape: Essays in Contemporary Landscape Architecture* (Princeton Architectural Press, 1999); Margaret Birney Vickery, *Landscape and Infrastructure: Reimagining the Pastoral Paradigm for the Twenty-First Century* (London; New York: Bloomsbury Academic, 2021); Charles Waldheim, *Landscape as Urbanism: A General Theory* (New York: Princeton University Press, 2016); Charles Waldheim and Alan Berger, "Logistics Landscape," *Landscape Journal* 27, no. 2 (2008): 219-46.
28. Frichot et al., *Infrastructural Love*.

pragmatics,'[28] that is, the need to give free rein to our imagination, while remaining firmly anchored to the ground. A change in strategy is increasingly urgent since caring for infrastructural grounds is, in the end, caring for our contemporary city.

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