Special Issue Future of Smart Cities

FUORI LUOGO

Rivista di Sociologia
del Territorio, Turismo, Tecnologia

Guest Editors
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Luca Bottini

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Fabio Corbisiero

Smart cities: how to unclog the untamed urbanization

Due to the latest dramatic urbanization increase with a future of megacities trends, the concept of smart city has come as one of the several models of urban development in the contemporary society, which is directly based on the production, distribution, and use of knowledge and technology exceptional. The "Department of Economic and Social Affairs" of the United Nations (2018) predicts that 68% of the world's population live in urban areas by 2050. Urbanization is an ongoing trend, cities are constantly growing, and more and more people live in urban areas. This poses many challenges for cities and their management related to societal, environmental, and economic hurdles that must be overcome to enable a good quality of life. Smart city can help successfully master some of these challenges – thanks to numerous technologies that are entering the economy that connect humans, technology, and cities in an intelligent, resource-saving way. The aim of a smart city is to improve the quality of life of its dwellers, by making the city more adaptive and efficient, using new technologies that rely on an ecosystem of objects and services. It means smarter urban transport networks, upgraded water supply and waste disposal facilities and more efficient ways to light and heat buildings. It also means a more interactive and responsive city administration, safer public spaces and meeting the needs of an ageing population. Starting from the assumption that even today there is no univocal definition of "smart city", the adjective *smart* is indebted to the concept of "intelligent city" (Castells and Hall, 1994), mainly involving the relationship between urban space and technology, and including issues such as the ability to generate innovation, transition towards forms of e-governance, social learning, and the possibility to provide ICT infrastructures. A smart city is rather a process, or series of steps, by which cities become more liveable and resilient and, hence, able to respond quicker to new challenges. Among all the most advanced urban contexts, Singapore is probably the city that identified most with the idea of the intelligent city; it funded a huge computing infrastructure project destined to both businesses and citizens as part of its branding as an "intelligent island" (Arun and Yap, 2000). Singapore introduced many smart city projects in all aspects of life, for example, by using an autonomous fleet to help older people or those with limited mobility move around or adopting robotics and AI-powered chatbots talk to the elderly to provide relevant information and reduce loneliness or, yet, digitizing the healthcare system that, amongst other things, allows for TeleHealth video consultations and TeleRehab.

However, many more cities around the world have integrated the vision of the ICT city into their development strategies (Helsinki, Zurich, Oslo, Amsterdam, New York City...). Smarter solutions are nowdays necessary to better address emerging requirements in urban environments.

From the social research perspective, smart cities are inherently transdisciplinary: they require investigation and cooperation across several disciplines, spanning from sociology to other social sciences, from urban planning to infrastructure management. Specifically, researchers are actively pursuing advances in information, communication technologies and artificial intelligence. This has led to many situations where intelligence is pursued for the sake of intelligence, resulting in inefficient use and allocation of resources. Finally, smart cities need to tap not only on the information from various sensors, but on citizens themselves. Indeed, citizens are not only passive actors and final users of smart city services, but can play an active and fundamental role in improving the urban ecosystem and addressing its challenges. In addition, where the state of the art in ICT doesn't allow for automated processing, citizens can collect, filter, and assess information with a crowdsourcing approach. Managing the life cycle of city data requires denoising, cleaning, anonymization, or privacy protection. Integrating heterogeneous sources of urban data - including sensors and social media - calls for further exploration of fusion, interpretation, lifting, aggregation, analysis, and correlation techniques. Smart cities are complex systems that combine material, cyber, cultural and social systems. They are an integration of urban

informatization, knowledge, creative city, sustainable development, and ecological livability and go beyond the perspective of ICT perspective, highlighting the importance of the interactions between the different human e non-human systems.
Faced with the development of this city model, it is necessary to build a sociological approach both from a theoretical and methodological point of view capable of analyzing and understanding the needs of these cities and their population (Kolesnichenko et al., 2021). As regards the methodological aspect, sociology can offer numerous useful tools for the study of the smart city as a social phenomenon as well as the different social processes within it, which see numerous actors involved. Niezabitowski (2022) underlines the usefulness and validity of different social research tools in the study of smart cities. In this sense, questionnaires can be useful in studying citizens' perceptions of infrastructure or in creating quality of life indices. Interviews, in-depth or semi-structured, are a valuable tool for analyzing the most reflective and individual aspects of the actors involved in the smart city, such as personal experiences or memories of the past useful for discovering, for example, the change in the city. Another method is that of comparative studies, which offer the possibility of comparing different realities based on pre-established criteria in order to analyze the effect of the application of technologies in different cities or neighborhoods. Other methods can be Participatory Action Research (PAR), through which researchers and citizens can be involved in different actions within the urban context, such as the implementation of participatory urban policies, or SWOT analysis, useful in the analysis of the external and internal contexts of cities.
Kim and Yang (2023) use *Social Network Analysis* (SNA) to study governance in smart cities, analyzing the connection between cities, services and stakeholders. On the other hand, Rijshouwer et al. (2022) use focus groups as a tool in analyzing citizens' perceptions of the smart city, focusing especially on the subjective construction of the city. Even non-scientific institutions are interested in studying smart cities with a methodological approach. For instance the EU (2023) have identified, through a comparative analysis of various case studies, the main risks and challenges of European smart cities summarized in these six macro groups: a. privacy, surveillance and cybersecurity; b. data loss, inaccuracy and poor reliability; c. digital inequality and exclusion; d. financial (or other) obligations for authorities and service providers; e. economic damage and inequalities; f. loss of trust and approval of the service. One of the latest example of a smart city process, strongly characterized by a focus on proximity and accessibility, is the so-called "15 minutes city" (Moreno, 2016). The idea owes much to its many predecessors: "neighborhood units" and "garden cities" in the early 1900s, the community-focused urban planning pioneered by the activist Jane Jacobs in the 1960s, even support for "new urbanism" and walkable cities in the 1990s. One of the most sensational cases in this way is Paris'hyper-proximity plan. It aims to reduce air pollution and lost commuting time, improve population' quality of life and help the city become carbon neutral by 2050. This process include the installation of cycle lanes on every street and bridge (facilitated by freeing up more than 70% of on-street parking spaces for other uses); the expansion of office space and co-working centers in urban areas; and the use of facilities and buildings outside of normal opening hours; encouraging people to shop locally; creating small parks on campus that are open to the public when students are not using them to create more green space.
Also in this case, the set of sociological tools can offer an important contribution to conceptualize this topic. Tools such as Geographical Information Systems (GIS) can underline the existing connection between individuals and social space, very useful in the analysis of fundamental dimensions in this city model such as walkability (Corbisiero e Napoletano, 2023; Colleoni et al., 2017). This special issue volume of *Fuori Luogo* highlights the need to go even further with respect to the sociological knowledge accumulated to date on the concept of smart cities as well as on socio-political structures to accommodate the modern needs of involving citizens extensively in building these cities, not only figuratively but also literally.

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Monica Bernardi, Luca Bottini[1]

Introduction

The smart city paradigm has been on the agenda of local governments for at least a decade (among the others: Anthopoulos, 2015; Meijer & Bolívar, 2016). The idea of envisioning and creating an "intelligent" city able of harmonising growth, sustainability, and improving the quality of life for its citizens is the objective pursued by urban policies moving in this direction. The continuous increase in populations choosing to migrate to cities in pursuit of better opportunities and services has led major metropolitan centres around the world to experience a constant flow of urban growth over the past decades. The impact of this growth on the demand for commons such as energy, services, space, and other resources has prompted scholars to explore new modes of governing contemporary cities (Obringer & Nateghi, 2021).

The smart city paradigm emerged in the early 2000s as a new approach to interpreting the pressing challenges posed by ongoing and unstoppable urban transformation; indeed, it marked a significant shift in how urban development was conceptualised and addressed. The idea of smart city developed over time, moving from a more technological perspective, with a focus on the role of advanced technologies in optimising urban systems and services, as emphasise by authors such as Caragliu, Del Bo and Nijkamp (2011), to a more citizen-centric perspective, advocated by authors like Nam and Pardo (2011), and Hollands (2008), according to which citizens should be put at the core of the smart city initiatives, promoting their engagement, participation, and co-creation of urban solutions. Authors such as Giffinger and colleagues (2007) underscored also the importance of sustainability and eco-friendly practices, while Janssen and colleagues (2015) and Deakin and Al Waer (2011) emphasised the importance of a governance model able to involve multiple actors in decision-making processes for effective smart city implementation. In general the smart city paradigm has always aimed to prevent societal harm by leveraging the parallel development of information technology, promising a gradually sustainable quality of life capable of addressing the challenges imposed by urban transformations (Townsend, 2013). However, as time has progressed, urban development has had to confront a monumental change for which cities themselves can be considered among the main culprits: climate change resulting from the ever-increasing emission of greenhouse gases into the atmosphere. Cities, since the Industrial Revolution, have been the hub of factories and manufacturing economies (Klein & Kraft, 2018). The economic and technological progress exacted an enormous cost in terms of human-generated emissions starting from the 19th century. The transition from the Fordist era to a post-industrial urban society, while liberating cities from large industrial settlements and embracing a more environmentally friendly vision, did not eliminate the problem of climate change, which continued to worsen over time (Huang-Lachmann & Ting, 2019)

Today, cities find themselves compelled to actively participate in a necessary global shift aimed at promoting decarbonization processes and energy transition to mitigate the impact of climate change on human societies. The scenario that has unfolded forcefully challenges the concept of the smart city, as one of the foundational characteristics of this paradigm is the intelligent use of environmental resources and, more broadly, the diffusion of a sustainable approach to cities (Arroub *et al*., 2016). Consequently, the smart city paradigm is now subject to greater scrutiny than in previous eras, as it plays a critical role in transforming processes and urban innovation towards a sustainable future, and it is called to adopt a more resilience-centric perspective

As we question the prevailing "smart city" paradigm, it becomes evident that the theoretical framework that has guided discussions so far should serve as a solid foundation for the creation of bold new policies. What will the smart city of the future look like? How will the concept of sustainability be realized in the smart cities of the future, given the current challenging situa-

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tion? This special issue tries to answer to these questions exploring the future of smart cities in a climate-neutral scenario, focusing on the sustainability of the urban environment. It develops from the conference held in 2022 in Bozen, titled "Smart and Sustainable Planning for Cities and Regions – SSPCR 2022". The papers that participated in the panel "The Future Of Smart Cities In A Climate Neutral Scenario", coordinated by the guest editors of this special issue, Monica Bernardi and Luca Bottini, have been selected for publication in this edition with the objective of reflecting on the challenges of future smart cities and discussing the necessary adaptations this paradigm must consider to guide the actions of policymakers in the field of decarbonization and environmental sustainability in contemporary cities.

In particular, the special issue includes seven contributions that address the most relevant aspects of the smart city concept and its future challenges. Following their propositions the special issue goes from the macro to the micro urban level.

The first contribution has a wide-ranging gaze on the topic, approaching the urban macro level: Bernardi and Aquili's essay reflects indeed on the reformulation of the smart city model in terms of technology, circularity, sharing, self-sufficiency, and proximity that cities are embracing to address climate change. In particular, it analyses several Italian cities in the context of the "100 Climate-Neutral and Smart Cities" EU Mission, questioning the governance model that best translates the mission's demands in light of urban needs. In doing so, the authors contribute to the ongoing discourse on the best approaches to translate the mission's requirements into practical and impactful solutions. One notable contribution of the essay is the identification of the co-city model, proposed by Foster and Iaione, as an embodiment of the EU requirements. This model, grounded in a penta helix approach, recognizes the collaborative efforts of five key stakeholders – government, academia, industry, civil society, and the local community – in driving sustainable urban development. By endorsing the co-city model, the authors advocate for a holistic and inclusive approach to achieving the European goals by 2030 in a fair and just manner.

The Crivello's essay provides a comprehensive exploration of cities as crucial sites for contemporary energy transition, drawing from the perspective of urban sociology. The author's theoretical reflection brings attention to the multidimensionality and complexity of this phenomenon, which is influenced not only by tangible climate change but also by the ongoing debates and social constructions facilitated by various actors within this context. The core objective of this contribution is to propose critical approaches and innovative practices that integrate environmental protection with the imperative of social justice. Additionally, the contribution underlines how urban sociology, through conceptual and methodological tools, can help to understand the phenomenon of the energy transition and contribute to identifying possible solutions.

While keeping a steadfast focus on the dimension of social justice in the context of climate change and energy transition in smart cities, Terenzi's contribution offers a comprehensive examination of the relationship between social inequalities and urban regeneration, using the specific case of Genoa as an illustrative example. By delving into this case study, the author effectively demonstrates the interconnectedness of addressing social disparities and promoting sustainable urban development paradigms. The analysis of the Genoa case allows Terenzi to document a close and intrinsic link between the fight against social inequalities and the promotion of urban development paradigms that prioritize sustainability and societal well-being. This exploration sheds light on the critical role of urban regeneration in fostering a more equitable and sustainable future.

Conte and Anselmi's contribution start with a thorough exploration of the phenomenon of short-term rental platforms within the city of Milan. Their analysis extends beyond the immediate effects of these platforms to examine their broader impacts on the city' touristification and urban sustainability. By delving into this topic, the authors shed light on the crucial role that public administration plays in shaping the outcomes for the city's sustainability. The contribution brings attention to the need for proactive governance strategies and policies that consider the broader social, economic, and environmental implications of short-term rentals. It underscores

the importance of striking a balance between promoting tourism and preserving the liveability and sustainability of the city.
Moving from platforms to enterprises, the paper authored by Mura, Aleotti, and Diamantini examines the significance of decision-making processes within companies in generating positive sustainability outcomes that transcend organisational boundaries and yield favourable effects on the broader urban environment. By integrating sustainability considerations into decision-making processes, companies can indeed contribute to positive impacts on the environment and society as a whole. The insights provided by the analysis of the three case studies demonstrate practical examples of how companies can proactively contribute to sustainability beyond their organisational boundaries. This not only benefits the companies themselves but also yields favourable effects on the broader urban landscape, including social, economic, and environmental aspects. This heightened awareness is essential to foster a sustainable relationship between local public and private entities, ultimately leading to positive impacts on the urban landscape.
The micro level is finally reached through the works of Bottini on the one hand and Landi and Raimondi on the other. Bottini's essay reflects on the role assumed by urban neighbourhoods as engines of innovation and transformation of social behaviours from the grassroots level. The author critically examines how the spatial characteristics of these neighbourhoods can either promote or discourage positive phenomena for society, with a specific focus on pro-environmental behaviours. By proposing the "Neighborhood-Perceptions-Sustainable Behaviors" (NPSB) model, Bottini provides a conceptual framework to understand the complex interaction between the urban environment and citizens in fostering sustainable behaviours to achieve comprehensive climate neutrality goals. This model highlights the intricate relationship between neighbourhood characteristics, individuals' perceptions, and the resulting behavioural patterns related to sustainability.
Lastly, the contribution by Landi and Rimondi focuses on the pivotal role of urban neighbourhoods as centres of socio-ecological innovation, similar to the emphasis seen in Bottini's work. The authors put forth a methodology aimed at comprehending how neighbourhoods serve as catalysts for driving change and transformation in socio-ecological practices. Through a series of case studies, they substantiate the notion that a city cannot be governed using a "one-size-fits-all" approach, but instead requires tailored strategies for each neighbourhood, which is an urban entity with its own distinct characteristics, autonomy, and specificities. The contribution by Landi and Rimondi challenges the notion of a homogeneous city and advocates for a more nuanced understanding of urban governance. By embracing the diversity and individuality of neighbourhoods, cities can foster innovation, promote sustainability, and create thriving communities.
This special issue aims to provide a comprehensive understanding of the future of smart cities by exploring sustainable urban development from various perspectives. The articles within this issue share a common theme of interconnectedness, highlighting the complex factors involved in achieving sustainability goals. They delve into interdisciplinary aspects such as technology, governance, social justice, energy transition, decision-making processes, and neighbourhood dynamics.
By unravelling the intricacies of urban sustainability and presenting innovative strategies, this special issue seeks to inform policy development, inspire transformative practices, and guide cities towards a sustainable and resilient future. The contributions offer valuable insights into the challenges and complexities inherent in achieving sustainability goals within urban environments.
The issue also presents complementary reviews of three recent books that take stock of the state of smart cities. The first book, reviewed by Francesco Calicchia, is "Ripensare la smart city/ Rethinking the smart city" (2018) written by Bria and Morozov. Here the authors argue that the predominant vision of smart cities often prioritises technological solutions over the needs and well-being of citizens. They critique the top-down approach that places a heavy emphasis on data collection, surveillance, and efficiency while neglecting the social, democratic, and envi-

ronmental dimensions of urban life. They advocate for a more human-centred and inclusive approach to urban development proposing alternative frameworks that prioritise social justice, democratic participation, and the empowerment of communities. Overall, the book challenges the dominant narrative of smart cities and encourages readers to reevaluate the role of technology in urban development.

The second book, reviewed by Antonella Berritto, is "Città aumentate/Augmented cities" written in 2021 by Maurizio Carta. In this book, the author presents ten conceptual and operational gestures aimed at empowering cities, regardless of their size, to effectively respond to the challenges of the 21st century and resiliently navigate the Anthropocene crisis. These ten gestures serve as a guide to transform cities into "augmented cities" able to provide tangible solutions to the key challenges of our time, such as mitigating and combating climate change, fostering the knowledge society, reshaping the global networks of cities, and enhancing the overall sustainability of urban ecosystems. By offering concrete strategies and approaches, "Città aumentate" provides a framework for urban transformation and serves as a valuable resource for policymakers, urban planners, and researchers. The book encourages cities to embrace innovation, collaboration, and sustainable practices, enabling them to become engines of positive change in the contemporary world.

The last book, edited by Giulia Agrosì in 2022, and titled "La smart city e la città comoda. Una nuova realtà futurista «smartiana»/The smart city and the convenient city. A new «Smartian» futurist reality", has been reviewed by Maria Camilla Fraudatario. The book examines the functioning of urban and environmental nevralgic energy centres, highlighting their synergy with human beings and their integral role in achieving a synchronised intersectoral balance within the urban connective system. The author delves into various topics related to urban sociology in the context of the smart city, exploring the methods and approaches for transforming it in a comfortable and sustainable place. This includes aspects such as housing-environmental dynamics, microclimatic considerations, energy systems, legal frameworks, cultural-architectural elements, museum integration, digital technologies (such as IoT, GIS, and BIM), and the vital role of the National Recovery and Resilience Plan (PNRR) in shaping the evolution of digital infrastructures in Italy. In general, the book paints a vision of a future where cities are optimised for comfort, sustainability, and interconnectedness, and sheds light on the pivotal role that digital infrastructures and the smart city concept play in shaping this transformation.

Overall, this collection of articles contributes to a nuanced understanding of the future of smart cities, emphasising the need for interdisciplinary approaches and the integration of various factors in creating sustainable urban environments. The aim is to provide actionable knowledge that can drive positive change, foster innovation, and support the development of resilient cities. For this reason, beside the seven contributions, the issues also offers an interview with a distinguished scholar in the field, Professor Mark Deakin of Edinburgh Napier University, who has been critically analysing for years the conceptual foundations, semantic nuances, narrative constructions, and practical manifestations behind smart cities. The interview, thoughtfully curated by Sergio D'Agata, presents an insightful dialogue that delves into smart cities' complexity, addressing local governance, data ownership, and climate management. In his responses, Deakin emphasises the crucial shift towards smart cities in addressing climate change and urban growth challenges; he underscores the role of public local governments in underwriting this transition and highlights the opportunities and threats associated with private data ownership; and also points out the persistent challenges in managing climatic events, such as the need for real-time strategic management and scientific understanding. His insights revolve around creating environmentally just and fair urban growth and leveraging interdisciplinary research and innovation to address climate change adaptation and extreme weather events.

Concluding, the issue with its contributions, the interview, and the book reviews offers a nuanced understanding of the future of smart cities, highlighting the need for interdisciplinary approaches and the integration of various factors in creating sustainable urban environments.

The aim is to provide actionable knowledge that can drive positive change, foster innovation, and support the development of resilient cities.

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Monica Bernardi, Alberica Aquili[1]

Beyond "Climate-Neutral and Smart Cities": Reflections on Strategies and Governance Models[2]

Introduction: "Code Red for Humanity"

In August 2021, the Intergovernmental Panel on Climate Change (IPCC, 2021) published a study concluding that humans' damage to the planet is a "statement of fact" and the Paris Agreement goals are "beyond reach". António Guterres, UN Secretary-General, has talked of "code red for humanity", stressing the irrefutable evidence of human influence and drawing attention to the seriousness of the situation. Other recent UN Climate Change reports, presented during the Sharm El-Sheikh Climate Change Conference in November 2022[3], and the 2022 IPCC report (IPCC, 2022) have confirmed the inadequacy of current climate plans that are unable of avoiding the rise of global temperature to 1.5 degrees Celsius by the end of the century (UNFCCC, 2022). Despite efforts in many countries to reduce greenhouse gas emissions, more ambitious actions are needed (United Nation, 2011).

The impacts of this scenario are most concentrated in cities (climate-induced mass migrations, overpopulation, pandemics and conflicts over resources, the source of 72% of greenhouse gas emissions) (IPCC, 2022) but they can also play a fundamental role in the decarbonisation mission (Bulkeley, 2013; van der Heijden *et al.*, 2019). The vision that each city is working towards in tackling urban challenges, in particular within the framework of climate change, is particularly significant.

This article proposes a range of city models (section 1) suggested by the literature on the approaches to the challenges facing cities (the smart and sharing city model, the "15-minute city", the self-sufficient city, the circular city, the co-city) in order to frame the approach to responding to urban issues. Specifically, the main questions are: how to answer the increasing demand for food, energy, housing, water, transportation, and healthcare that can only be made even more significant by climate change? And how to provide all these services in a fair and just way while respecting people and without impacting the environment?

In this direction, Europe and the European Commission are promoting actions in order to meet the 2030 climate neutrality goals and bring concrete solutions to the main challenges. Five EU Missions have been launched for the period 2021-2027. Among these is the Horizon Europe Mission on "Climate-Neutral and Smart Cities", which aims to identify and deliver 100 climate-neutral and smart cities by 2030 in order to inspire other cities to follow their example by 2050. Nine out of the 100 cities selected are Italian: Bergamo, Bologna, Florence, Milan, Padua, Parma, Prato, Rome and Turin (MUR, 2022; European Commission *et al.*, 2020).

The EU mission and its limits are described in detail (section 2) before investigating the general scenario of those Italian cities that are active in the field of climate change, within the framework of or simply inspired by the EU Mission (section 3).

This is the basis for some preliminary reflections on the actions and governance models of cities (section 4), advancing the hypothesis that a Co-City model based on a penta-helix approach, like that proposed by Foster and Iaione (2016, 2019, 2022), could be a better answer to our questions and more effectively embody the EU requirements, helping cities to meet the EU goals by 2030.

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3 All Coop27 documents can be found here: https://unfccc.int/cop27/auv.

1. Fragile cities and urban models

In all cities and urban areas, the likelihood of disasters associated with climate change is increasing (IPCC, 2022), with all the attendant risks for people and assets. There is a direct link between environmental issues and phenomena such as urbanization, overpopulation and overconsumption, creating a kind of vicious circle of resource scarcity, pollution and ageing infrastructure. In addition, urban vulnerability is rising most rapidly in cities and settlements with low capacity for adaptation and the effects concern not only current urban populations (Martinotti & Forbici, 2012) but also future generations and people living outside cities, throwing into doubt issues such as access to services access and security in cities (food, water, energy and mobility etc.). Global population growth only worsens the situation. Currently, there are 8 billion people on Earth but that figure is forecast to reach 9.9 billion by 2050 (PRB, 2021). Around 55% (4.2 billion) of the global population already live in urban areas and this is expected to increase to 6 billion by 2050. That means that 7 out of 10 people around the world will live in cities by that date.

Under this scenario, cities will experience conditions of fragility and face a whole range of challenges – environmental, economic and social – as well as an increase in conflicts, rising inequality and the lack of equal access to opportunities and resources (IPCC, 2021, 2022).

Nevertheless, cities are considered pivotal in the literature in addressing fragilities and making progress towards climate neutrality (Bulkeley, 2013; van der Heijden *et al.,* 2019). By acknowledging that the future of civilization is dependent on urban centres, the need to prioritise urban management through comprehensive approaches that encompass issue resolution becomes apparent. In the field of urban studies, the fundamental question revolves around how cities can adequately prepare and adapt, both physically and conceptually, to deal with the complex challenges presented by climate change (IPCC, 2022).

Various ideas have emerged over time in an attempt to address the main urban challenges. In the last decade, in particular, some city models have been reimagined and improved in order to more effectively tackle climate change and overcome the city's structural fragilities.

One of these models is the idea of the *smart city*, with the aim of managing cities in an integrated manner, providing the tangible and social infrastructures (March & Ribera-Fumaz, 2016; Batty *et al.* 2012, Caragliu *et al.* 2009). Caragliu *et al.* (2009) stated that a city would become smart "when investments in human and social capital and traditional (transport) and modern (ICT) communication infrastructure fuel sustainable economic development and a high quality of life, with a wise management of natural resources, through participatory governance" (p. 50). This definition stresses the development of the economy, the sensible use of natural resources, and the engagement of citizens in a participatory governance model. Technology enables citizens to access urban resources and deal in an efficient and cost-effective way with the main urban issues, such as mobility, energy, pollution, water etc. The shift from the idea of an *intelligent/cyber/digital* city to that of a *smart city* reflected the desire for a more inclusive and sustainable environment (March & Ribera-Fumaz, 2016). However, this has often been decried as too uncritical an approach, mainly conducted at a discursive level through policy documents, guidelines, and blueprints (Deakin & Al Waer, 2012; Hollands, 2008; Vanolo, 2014), leading to the fragmentation of the proposals into a series of pilot programmes and the unequal distribution of benefits to citizens (Gibbs *et al.*, 2013).

The idea of a *sharing city* is basically a smart city that relies on smart technologies to improve the quality of life of citizens (Arcidiacono, 2017). The technological dimension is expressed through digital platforms (Kenney & Zysman, 2016) which amplify community exchanges based on reciprocity, collaboration and sharing (Pais & Provasi, 2015), thereby boosting the human factor and the idea of community. In environmental terms, the 'recirculation of idling capacities' (Rinne, 2017), the promotion of sustainability and lifestyles that reflect greater environmental awareness become core values. The proposed new social paradigm (Van Dijk & de Wall, 2018) also promotes inclusiveness and accessibility. In this case too, however, there are some problematic

issues. Economically, big platforms benefit most from an exploitative and 'netarchical' approach (Kostakis & Bauwens, 2014). Socially, the sharing economy appears to mainly benefit some specific groups, that is, the well-educated, employed, upper middle-class, with no housing problems and a sizeable income, millennials concentrated in densely populated urban areas, (Arcidiacono, 2017). What's more, the relational dimension is more discussed than it is implemented (Dubois *et al.*, 2014) and certain kinds of discrimination are reinforced rather than reduced (Eldman *et al.*, 2017; Pais, Del Maral, 2018). Environmentally, it is unclear whether the sharing economy has any positive effect (Codagnone *et al.*, 2016), what the real extent of the orientation of the platforms to sustainability is (i.e. Geissinger *et al.*, 2019) and whether platform users really are interested in sustainable lifestyles (Parguel *et al.*, 2016).

Another city approach with less impact on the environment is the so-called *self-sufficient city*, conceived by Guallart in 2012 (and adopted by Barcelona) as a "system of systems" in which technologies, ICT and self-sufficiency solutions are the "obligatory rite of passage" in order to "cure urban pathologies" (Söderström *et al.*, 2014 p. 308). Guallart (2012) says that "the Internet has changed our lives, but it hasn't changed our cities yet [...]. We are waiting to see the technologies that will transform our cities". In his vision, cities are the result of the interaction between nodes (homes, blocks, districts, neighbourhoods, cities, metropolises) and the connected flows (information, environment, people, transport, objects etc.). The city of the future is therefore a metropolis of self-sufficient neighbourhoods, capable of almost everything required at times of crisis in health, energy or food; it is a multi-scalable, globally connected city. The *smart city* attracts its fair share of criticism over the discursive level at which the self-sufficient city still remains, the difficulty in scaling up from experimental areas to the entire city, the risk of deploying the environment as the "legitimisation" of urban renovation and the promise to promote inclusiveness and citizen empowerment without clarifying how the citizen's interests can be reconciled with the interests of private capital and how the urban political elites can be engaged in a city's governance (March & Ribera-Fumaz, 2016).

The idea of small units within a broader smart city enshrined in the *self-sufficient city* is also found in the *15-minute city* proposed by Moreno (2020) and adopted by Paris, inspiring many other cities to replicate this approach. According to Moreno, the daily urban necessities of citizens (work, home, shops, entertainment, education and healthcare) should be within a 15-minute walking or biking distance (Allam *et al.*, 2022; Whittle, 2020). A new city rhythm is required, with fewer cars and more multipurpose services. In the opinion of Allam *et al.* (2022), the "15-minute city" can be an effective solution for restructuring cities and increasing sustainability, inclusivity, and economic equity. Moreno is inspired by the concept of the *living smart city*, based on proximity, diversity, density and ubiquity, in which every area within the city should provide six social functions: living, working, supplying, caring, learning, and enjoying (Moreno *et al.* 2021). Spatial, temporal and/or geographical proximity guarantees a marked decentralization of services at the local level and better service provision, thereby reducing disparities between urban districts (Pozoukidou & Chatziyiannaki, 2021). Density promotes the idea of a compact city where residents are at an optimum number to use sufficient resource capacity (Manifesty *et al.*, 2022). Diversity concerns mixed and multicultural neighbourhoods, which promote inclusiveness, foster sustainable practices and a sense of connection (Mocák *et al.*, 2022) as well as encouraging bottom-up dynamics (Allam *et al.* 2022). Ubiquity/digitalization are essential to achieve the other three aspects, speed up the processes and enable easy access to services. This city concept has been criticised for being physically deterministic and taking a one-size-fits-all approach (Khavarian-Garmsir *et al.*, 2022); moreover, the function of "working" is difficult to achieve since homes and workplaces have been kept apart for years, increasing the dependency on cars (Mocák *et al*., 2022).

A final type (of the various models in the literature) is the *circular city.* Here, a circular approach is applied to the management of city resources (water, food, materials, energy, land) in order to reduce the consumption of limited resources (Williams, 2019). The concept of the circular econ-

omy has been systematized by the Ellen MacArthur Foundation (EMF) through the RESOLVE framework, which proposes six actions to favour circularity: regenerate, share, optimise, loop, virtualise, and exchange. Prendeville *et al.* (2018) define a circular city as "one that practices the principles of the circular economy to close resource loops, in partnership with the city's stakeholders (citizens, community, business and knowledge stakeholders), to realize its vision of a future-proof city". If cities are able to close resource loops and reduce waste, their ecological footprint diminishes and they become regenerative and adaptive urban ecosystems (Williams, 2021). According to Fratini *et al.* (2019), the concept of the circular economy is criticised for lacking a strong scientific basis, being "created mainly by practitioners, the business community and policy-makers" (Korhonen *et al.*, 2018 p. 45), and for being "over-hyped, scarcely investigated and therefore as yet ill-defined" (Prendeville *et al.*, 2018, p 172). This is also true of the circular city, mainly defined (and not always clearly) by policymakers with companies and practitioners that prefer to use affordable experimentation and business incentives, such as collaboration platforms, funding mechanisms, and knowledge-building approaches. Moreover, while the roles of citizens and communities are respected, there seems to be a mismatch in how these stakeholders are included in building a circular vision for the city. Instead, the focus from the outset is on the key city stakeholders, data-driven digital approaches and policy development (*ibidem*).

2. Climate neutrality for european smart cities

2.1 What is climate neutrality

Currently, under the scenario described above, all the city models tend towards so-called climate neutrality and thereby become *climate-neutral cities*. Climate neutrality means achieving net zero greenhouse gas emissions (GHG) by cutting emissions, investing in green technologies, and protecting the natural environment (Höhne *et al.*, 2015). According to the European Commission (2020), a strategy for climate neutrality suggests that:

- "Cities aim to move towards net zero by reducing GHG emissions as much as possible and by developing trade-off mechanisms in order to offset the remaining unavoidable emissions; and,
- cities aim to become climate-proof, or resilient to the negative impacts of the changing climate, by improving their adaptive capacities".
  Mitigation (reducing the reliance of cities on carbon /net zero carbon emissions) and adaptation (adapting cities to climate risks / future-proofing, resilient cities) are two aspects of an integrated urban response; in combination, they lead to a climate-neutral city based on sustainable development with multiple benefits for the economy, society and the environment (United Nation 2011).

2.2 "100 climate-neutral and smart cities"

The European Commission has adopted a mission-driven approach to guide the Horizon Europe Research and Innovation Framework Programme (European Commission, 2020). The goal is to advance the Green Deal and the European Sustainable Development Goals. Among the five main missions, one is dedicated to creating 100 climate-neutral and smart cities[4] that will serve as the model for all European cities. The EU Commission selected the 100 cities through a Call for Expression of Interest, choosing from 377 proposals and 12 associated countries[5].

4 The other missions concern adaptation to climate change, cleaning the oceans, fighting cancer, and soil health and food security (https://tinyurl.com/t5wr4em7).

5 The Commission has put in place support for cities that were not selected, including through the Mission Platform and funding opportunities under the Cities Mission Work Programme of Horizon Europe.

These cities are receiving support from the international NetZeroCities consortium in their efforts to achieve climate neutrality by 2030. NetZeroCities brings together citizens, academia and businesses to implement innovative actions and transformative processes. It offers a comprehensive platform for cities, providing access to online resources, tools, peer-to-peer learning, and collaboration spaces.

The role of citizens in the city's governance is regarded as crucial for the success of the mission since they are in a position to transform and innovate. According to the EU commission, three governance principles should be followed: a holistic and integrated approach to foster innovation and development; multi-level governance involving all the actors in the processes; extensive and continuous collaboration between all stakeholders in the processes of inclusivity and co-creation (*ibidem*). Together with all the local stakeholders, the citizens, academia and businesses, each city is also called upon to jointly draw up a Climate City Contract (CCCs), a dynamic, strategic and evolving document aimed at setting up five driving forces for transformation: new forms of participatory and innovative governance; a new economic and funding model; integrated urban planning; digital technologies; innovation management (European Commission, 2020). The CCC is regarded as a Memorandum of Understanding signed by the Mayor that expresses the clear political commitment of the city to its citizens, the Commission and the national and regional authorities.

The benefits of being part of the mission include: tailor-made advice and assistance; access to additional funding and financing opportunities; extra research and innovation funding opportunities and the chance to join pilot projects and demonstrations; support from a national coordination network; new networking, learning and exchange opportunities among cities; support in the process of involving citizens in decision-making; high visibility.

The Mission lays down the six main principles/building blocks of an integrated approach: strategic dimension; territorial focus; good governance; cross-sectoral approach; a multiplicity of funding sources; effective monitoring.

To ensure a just transition, the Mission stresses the importance of mapping social vulnerability, connecting to existing tools and initiatives, widening society's participation in the decision-making process, integrating fairness in policy and the assessment and monitoring programmes, and enshrining equity in energy governance.

Despite the creation of an "Info Kit for Cities", some areas of ambiguity and a lack of guidance have been identified by Shabb *et al.* (2022). The distinction between climate neutrality and carbon neutrality is sometimes unclear, with the risk that the mission's objective may be misinterpreted. The governance principles suggest a holistic approach and a multi-level framework but there is no practical guidance on implementation. The emissions monitoring methodology provided by the Global Covenant of Mayors for Climate and Energy is useful for detecting direct sources of emissions but does not address indirect emissions from construction and consumption in the city. There is also no clear explanation of how to deal with offsetting. There is some ambiguity around the nature of the CCC, whether or not it is legally or politically binding and to what extent. According to Shabb et al. (2020): "It is critical that the CCCs are an instrument that can define the objectives, how success toward targets can be tracked, and provide a mechanism to ensure the necessary political and financial support", otherwise the credibility of the process is harmed. Lastly, regarding the engagement of citizens and the inclusive participation approach, which is fundamental for the success of the mission, the report is vague on how to carry out the mission in an inclusive way yet inclusivity should be to the fore, from the design phase to the implementation of CCCs and the transformative actions of municipalities.

3. Different types of answers within and beyond the eu mission

3.1 The nine italian selected cities

Bergamo, Bologna, Florence, Milan, Padua, Parma, Prato, Rome and Turin are the nine Italian cities selected by the Mission to become pioneers of the Green Transition (MUR, 2022) through processes that will involve citizens, private entities (profit and non-profit), and public entities (such as European and national institutions, as well as regional and local authorities)[6].
In Italy, the first step to strengthen the commitment of the national authority and cities to achieving the Mission's goals was a *Memorandum of Understanding* between the Ministry of Infrastructure and Sustainable Mobility (MIMS) and the nine Italian cities[7]. The document proposes solutions, including regulatory measures, to design or implementation issues that may hinder the Mission's success. It also fosters collaboration for innovative projects, attracts funds, and creates a knowledge base for other entities to achieve the Mission more efficiently. Parties receive support from a Coordinating Committee and a Technical Round Table of experts.
The strategic commitments of the nine Italian cities, selected to embark on the path of decarbonization, are briefly analysed in the light of the documents of the official cities, local newsletters and reports by specialized agencies.

Bergamo. In recent years the city has been working on environmental policies to address climate change. As reported in the main local newsletters, its proposal sets several goals[8]:

a) waste: making the city a virtuous example of waste management, using the residual, undifferentiated portion to power district heating, thereby avoiding the use of fossil fuels, and integration with other sources of thermal recovery (e.g. sewage sludge) and/or solar thermal energy;
b) circular economy: implementing all forms of the circular economy, starting with a radical reduction of food waste;
c) energy: reducing emissions generated by electricity consumption in the civil and tertiary sectors through investments in photovoltaic systems, promoting the establishment of energy communities;
d) land: limiting land consumption by updating the Territorial Government Plan;
e) sustainable mobility: creation of a second tramway line (Bergamo-Villa d'Almè) and the expansion of the railway infrastructure for access to the city (connection with Orio al Serio airport, doubling of the line that passes through Ponte S. Pietro-Montello, expansion of rail services to/from Milan) in order to reduce road traffic;
f) sharing: the city also plans to promote electric and shared mobility (bike and car sharing) and new cycle lanes, also through the adoption of the Urban Plan for Sustainable Mobility (PUMS).

Bologna. The city of Bologna has always demonstrated a propensity to use renewable energy sources (Fabbricatti, 2016) and has been acting to reduce greenhouse gas emissions since 2005. According to some authors, its local, cooperation-based social structures could be an interesting starting point for a more egalitarian organization of the economy and society, but always needs to be updated (Caperna *et al.*, 2017).

6 The selected Italian cities have strong ties to the Recovery and Resilience Plan (PNRR), particularly in areas such as digitalization, innovation, and security in public administration (Mission M1C1); circular economy and sustainable agriculture (Mission M2C1); renewable energy, hydrogen, network, and sustainable mobility (Mission M2C2); energy efficiency and building redevelopment (Mission M2C3); and protection of the territory and water resources (Mission M2C4).
7 Read the Memorandum here: https://tinyurl.com/2c6p5nbb (accessed February 2023).
8 Read the complete description here: https://tinyurl.com/vpnk5es5 (accessed February 2023).

The city was selected for the mission based on two types of implemented measures. First, the adoption of plans such as the Sustainable Urban Mobility Plan (PUMS), the Sustainable Energy Action Plan (PAESC), the General Urban Plan (PUG) with the Green Plan. Second, regulations on existing and new buildings and districts, zero land consumption requirements and stricter energy upgrading standards in the PUG. In addition, new constructions or reconstructions must adhere to the ZEB (Zero Energy Building) classification. Other actions involve the electrification of local public transport, promoting sustainable mobility, transitioning to LED public lighting, and enhancing green areas by planting 2,000 new trees annually. Bologna's proposal for the Mission encompasses six main areas[9]:

a) Mobility and Transport: decarbonization of Local Public Transport, completion of Biciplan and incentives for active mobility, the creation of a Green Area;
b) Energy efficiency: energy upgrading of public housing, realization of positive energy districts, energy upgrading of university buildings;
c) Public lighting: completion of LED lighting conversion, zero emission energy supply for public lighting, smart city-adaptive lighting;
d) Waste: construction of the "Power to Gas" plant at the Hera purification plant in Bologna, interconnection of two energy systems to power the Fair and the University, installation of an electrolyser for the production of green hydrogen;
e) Renewable energy production: supplies from renewable sources, promotion of energy communities, energy communities in public housing (ERP);
f) Across-the-board "flagship" projects: Green Footprint, Digital Twin, City of Knowledge (Bologna Municipality, 2022).

In December 2020, as reported on the city's website and by local urban agencies such as the Fondazione Innovazione Urbana, Bologna organized a launch event to embark on the path to drafting the Climate City Contract. Along with the European Commission, its partners will be public institutions, businesses, local authorities and consortia including the University of Bologna, Hera, Guglielmo Marconi Airport, Tper and Acer, CAAB, LegaCoop, health companies, the Canal Consortium and the energy sector company Illumia. Bologna has stressed the importance of engaging citizens in the process of adopting a new participatory tool recently introduced in the City Statute: the Citizens Assembly for the climate. The Assembly will be made up of a group of citizens representing all local society, selected at random, who will work with the support of experts and facilitators in defining proposals for the City Council to examine and vote on.

Florence. The city has always been firmly committed to social, economic and environmental sustainability (Rimoldi & D'Orsi, 2022). This is borne out by its participation in important international networks, such as the Covenant of Mayors (since 2010), and by several European awards, including the European Energy Silver (2016) and 2021 Gold (2021) Awards for climate management in the municipal area (Florence was the only large Italian city to obtain this award out of 1700 virtuous European municipalities taking part in the programme)[10]. Renowned for its cultural, artistic and landscape heritage, as well as a thriving tourist industry, it is implementing a package of integrated plans for the ecological transition and actions to change the city's emission profile. Some examples: the Sustainable Energy Action Plan (PAESC) in the sustainability and energy sector; the Green Plan and the Structural Plan with Zero Volumes among the urban development plans, and a 2022 Municipal Operational Plan (Florence Municipality, 2023) – adopted for the first time along with the Structural Plan – which provided several new urban planning tools, with the aim of building no new hotels and offering services for all within a 15-minute walking distance, and 50 choices for a fair and forthcoming Florence through public and private innovation. There is a specific Smart City Plan (2015) with its own Digital Manifesto,

9 The areas of focus are described in the official documents of the Municipality and of the Metropolitan City: https://tinylink.net/FxkPr (accessed February 2023)

10 For more info: www.european-energy-award.org.

the PON Metro on smart cities and a Roll out Plan (Replicate-REnaissance of PLaces with Innovative Citizenship and Technology)[11] which aims to create smart city services through innovative technology, sustainable mobility, infrastructural innovations and energy efficiency. With regard to mobility, there is a specific Sustainable Urban Mobility Plan (UMSP), and the city is also working on circularity through the Actions for a Circular Florence, the Water Safety Plan, and the Local Plan for obtaining National Recovery and Resilience Plan (NRP) funds. Given this context, as reported on the city official website (Florence Municipality, 2022), the city's proposal included a five-pronged plan:

a) Energy efficiency and energy poverty (promoting renewable energy, optimizing and renovating public buildings, schools, sports centres, markets and social housing, as well as adopting energy monitoring schemes);
b) Services (Smart-street lighting with SILFI; smart water management with Publiacqua; Smart Waste and Florence Circular with Alia to reduce quantities, promote recycling, reduce the impact of waste collection);
c) a Smart Grid to improve the electricity grid in collaboration with grid operator E-distribuzione;
d) Sustainable mobility through the optimization of public transport through apps for purchasing e-tickets, advanced intermodality, a traffic supervisor, increased electric mobility and an electric sharing service, and through the adoption of a *smart city control room*;
e) Social innovation aimed at engaging citizens in greater social inclusivity through the Smart City platform and interaction with different "habitat teams", thematic groups formed by specific stakeholders and citizens). In 2020, they city launched the programme "Firenze Prossima", based on participatory paths, through which it has collected 2,000 proposals and signed eight research agreements with Florence University.

Milan. This is an Italian multimodal smart city, long committed to the ecological transition and the renowned capital of shared mobility. It considers the idea of a smart city not as technology-driven but centred on its citizens (Borrelli *et al.* 2015). The city has adopted specific guidelines for creating the smart city, considering Milan as a laboratory in seven areas: 1. boosting national and European networks; 2. sustainable urban mobility; 3. environmental and energy policies; 4. social inclusion and diversity; 5. Wellness; 6. simplification of the public administration; 7. business creation. The guidelines emerged from the work of multiple stakeholders (Galliano 2016).
Since 2012, the city has developed and adopted a range of plans in the following policy areas: sustainable mobility, energy efficiency, urban development, the sharing economy and smart cities.
The PAC-Air and Climate Plan aims for full carbon neutrality and a bicycle-pedestrian city by 2050. It envisages the gradual implementation of a bicycle-pedestrian city, a 30-km-per-hour area to significantly reduce car traffic, the energy upgrading of public heritage buildings, greening actions to reduce urban heat islands through pavement removal and increasing urban green spaces and forestation. The implementation of the PAC is being achieved through a participatory process involving citizens, associations, businesses and other city stakeholders. Thanks to these ongoing efforts, Milan was selected by the European Commission to join its Mission (EIT, 2022). Through its participation, Milan plans to implement a number of projects in the green sector, including:

- the Rotaie Verdi to create a large naturalistic oasis designed to connect the disused railway yards of San Cristoforo, Porta Genova and Porta Romana;
- the Nido Verticale, the new sustainable tower to be built in Porta Nuova;
- the Nuova Bovisa project, which will become the first truly international hub dedicated to research and innovation on energy and sustainable mobility issues.
  Milan is also embracing the circular economy and intends to build three photovoltaic-pow-

11 Info here: http://replicate.mathema.com/.

ered recycling areas, which will become reuse centres; it also plans an intervention on the Lambro River for the enhancement and return to the city of green areas, with the creation of a bike path and protection measures against flooding, increasingly frequent due to climate change (Facchini, 2022). In addition, the city has been working for many years on social innovation and, more recently, on city proximity initiatives (Tajani, 2021).

Padua. The city's participation in the EU Mission is grounded in the actions already implemented for environmental sustainability through the adoption of several plans (Ecopolis, 2022), such as:
- the PAESC (the Padua Sustainable Energy and Climate Action Plan), approved in June 2021 and required by the Covenant of Mayors
- the Green Plan for the implementation of new green areas
- a project for the promotion of bicycle mobility
- the Zero Land Use Interventions Plan for the reduction of land consumption
- the Sustainable Urban Mobility Plan (PUMS) for the enhancement of public transport through new tram lines based on a smart system

Furthermore, the project "Padua SoftCity" aims to make Padua a more innovative and ecological smart city, boosting community, sharing and collaboration[12].
As with other cities, the Climate City Contract must be drafted by the municipality together with additional urban stakeholders, both public and private, and will focus on the implementation of climate neutrality projects affecting strategic sectors such as: renewable energy, green infrastructure, construction, waste, transportation, circular economy, urban planning, drawing up specific investment plans.

Parma. As reported on the city's website (Parma Municipality, 2022a), Parma has produced a Municipal Structural Plan - PSC 2030 aimed at accelerating the process of transition to a greener, more sustainable, more modern and more inclusive city model. In 2020, it enjoyed a position of cultural leadership as the holder of the Italian Cultural Capital award. To apply for the Mission, it drew up a city vision, a roadmap and a plan of initiatives and funds. Specific smart city governance has been organised to work as a point of connection and an enabler for local stakeholders; by networking with other European cities[13], it has developed skills and project ideas. The city has outlined four key strategies:
a) Community bond for the involvement of different urban actors: citizens, Universities, Businesses;
b) Sustainable mobility, through a green area to limit vehicular access to the urban area, promoting cycling and sharing mobility, adopting the local public transport fleet renewal plan;
c) Eco-city: focus on urban regeneration to avoid land consumption and to "build on what has already been built";
d) Infrastructure: improving public lighting with LED and smart lighting, promoting energy and the seismic efficiency of public and private buildings, adopting a circular economy for the waste differentiation system, developing a real-time city management platform, reducing-water leakage and promoting urban forestation[14].

The first step towards these goals was the signing in December 2020 of the *Carbon Neutrality Parma Territorial Alliance* by the representatives of the 10 public bodies and private entities participating in the agreement: the Emilia Romagna Region, the Province of Parma, the Municipality of Parma, the Management Body for Parks and Biodiversity of Western Emilia, the University of Parma, ARPAE Emilia Romagna, the National Research Council, the Unione Parmense degli Industriali, Parma, *io ci sto!,* and the Kilometroverde Parma Forestry Consortium (Parma Municipality, 2020). This Alliance paved the way in December 2022 for the signing of the Climate City

12 The project can be examined in-depth here: https://padovasoftcity.it/#obbiettivi (accessed February 1, 2023).
13 Information taken from https://tinyurl.com/5n6tarw9 (accessed February 1, 2023).
14 More info here: https://tinyurl.com/bdzdjxk7 (accessed February 1, 2023).

Contract, in which actions and resources will be identified for attaining the goal of a Climate Neutral Parma in 2030. An Action Plan was agreed and backed up with an investment plan. Moreover, an internal working group was appointed in the City Council to meet the various stakeholders in the area (economic, production, commercial, associations, the cultural, social, health institutions) and arrange the signing of the Climate City Contract by mid-2023 (Parma Municipality, 2022b).

Prato. Prato's carbon neutrality policy is anchored in plans and actions adopted over the years by the city, such as the Sustainable Urban Mobility Plan (PUMS), the Sustainable Energy and Climate Action Plan (PAESC), the Urban Forestry Plan, the Prato Urban Jungle, the Next Generation Prato, actions for the energy efficiency of public and private buildings, and the Smart City plan (Prato Municipality).
For the purpose of signing the Climate City Contract, the City of Prato has launched a dedicated website to schedule joint design meetings in the form of focus groups and workshops mainly within the City's CTE-House of Emerging Technologies – in which the administration, citizens and relevant stakeholders in the area can participate. The goal is to use these meetings to define the city's 2030 Climate Neutrality Action Plan, focusing on key areas:

a. Energy Efficiency for sustainable and smart public lighting, efficiency upgrading of existing buildings, the promotion of renewable energy sources and coordination over the implementation of renewable energy communities;
b. Sustainable Mobility to create a network of cycle lanes, promoting electric mobility, sharing mobility; Sustainable Mobility Governance (through connections such as Home-School, Home-Work, a Timetable Plan, green zones and a Plan of Why), a new local public transport plan based on intermodality and smart logistics (based on drones, E-bike logistics, Smart City Services);
c. A Circular Economy through the financing of the textile district and a textile recycling hub, waste management, the adoption of a circular building regulations, the reuse of civil and industrial wastewater;
d. Agriculture, with the promotion of sustainable urban agriculture based on the construction of short supply chains, land use (e.g., by initiating the implementation of Nature-Based Solutions in private construction);
e. Urban forestry through interventions to build large parks and green infrastructure for climate change mitigation[15]. The Action Plan is important because it will serve as the basis for signing the Climate City Contract with the European Commission and other city stakeholders.

Rome. The proposal for which the city was selected aims to make Rome a major inclusive laboratory of the ecological transition. It is based on the PAESC, the Action Plan for Energy and Climate, through which it respects the commitments undertaken in 2017 with the signing of the 'Covenant of Mayors' and aims to reduce climate-changing emissions by more than 51% by 2030, well beyond the 40% set by that agreement (Rome Municipality, 2021). The pillars of action are:

- sustainable mobility, by enhancing the cycle network and revitalizing public transport and the transport network with interconnected services;
- realising the vision of the "15 minute-city" based on proximity services;
- the reduction of waste by closing the waste cycle, in which waste collection and disposal are supported by advanced technological tools, such as "smart bins" with increased recycling and energy recovery facilities;
- sustainable urban forestation (20,000 trees to be replaced, 1 million new trees by 2030, 2 million new trees by 2050);

15 For more information see the website of the Municipality of Prato: https://tinyurl.com/3rnsxemh (accessed February 3, 2023).

- the energy efficiency of the building stock, through photovoltaic systems and solar-powered houses;
- an increase in smart working in the public administration (to reduce the CO_2 in the atmosphere).

Turin. In the last 25 years, Torino has worked to become a more sustainable and resilient city, leveraging both its technological, engineering, academic, design and manufacturing flair and its artistic and cultural heritage. In recent years, it has focused mainly on sustainable development policies, working on the urban environment, green infrastructure and sustainable urban mobility. Its Action Plan, *Turin 2030, Sustainable and Resilient,* is the city's response to the UN 2030 Agenda and the 17 Sustainable Development Goals[16]. Its proposal for the EU Mission is based on a series of innovative and sustainable projects. In particular, the focus is on energy, waste, transportation, green urban planning and the smart city (Turin Municipality, 2023). The collaboration with local stakeholders is extensive, for example, with Turin Polytechnic's Energy Centre, the University of Turin, the ESCP Business School and the many actors in the local ecosystem participating on the two platforms of Turin City Lab and Turin Social Impact[17].
Its candidacy was also bolstered by the adoption of the Sustainable Energy and Climate Action Plan (PAESC) in January 2023, which rolls out a series of different actions in several areas: from the residential and tertiary sectors to the public sector, transportation and urban mobility, district heating and local power generation, from renewable sources to urban forestation interventions (Turin Municipality, 2023).

It should be noted that all the mission cities are working to develop the CCC, which includes a Climate Neutrality Action Plan and a Climate Neutrality Investment Plan, in order to assess the cities' financial needs and ways to address them.

3.2 EU mission-inspired cities: the case of Reggio Emilia

Within the group of pioneering cities in Italy aiming for climate neutrality are cities inspired by the Mission. Not all can be covered here, but it is worth mentioning Reggio Emilia as the first Italian city to have "institutionalized" and regulated a Climate City Contract within its Regulations on Democracy, Urban and Climate Justice. This shows what a significant step forward Reggio Emilia has taken compared to other selected cities.
Reggio Emilia has a rich history of sustainable and eco-friendly urban projects, emphasizing deliberative democracy and civic participation. Since 2015, the Quartiere Bene Comune programme has been laying the groundwork for a collaborative city. In 2016, the *Reggio Collaboratory* was launched in partnership with the University of Modena and Reggio Emilia, supported by LagGov ETS NGO and Kilowatt. This initiative acts as a hub where social and technological innovations can be incubated and accelerated. The city has also organized various open labs with citizens and drew up a Smart City Memorandum of Understanding in 2017 to guide digital and innovative development in the region. In 2018, the city adopted the *Regulation of Citizenship Laboratories and Citizenship Agreements*. Noteworthy initiatives include the *Coviolo Wi-Fi Community*, which aims to bridge the digital divide at the neighbourhood level, and the *City Science Initiative*, the *City Science Office*, and the Horizon 2020 European project EUARENAS (Cities as arenas for deliberative democracy), in which Reggio Emilia serves as a pilot city.
With the approval of the *Regulation on Democracy and Urban and Climate Justice* in September 2022, Reggio Emilia intends to establish a new governance structure for the Municipality based on participation, collaborative bodies, and protocols. The goal is to achieve participatory administrative planning that addresses genuine territorial needs and implements a sustainable,

16 Information from https://tinyurl.com/2jnm3v2v (accessed February 5, 2023).
17 See: https://tinyurl.com/2p922t5t (accessed February 5, 2023).

equitable, and inclusive model of urban development. Through this Regulation, Reggio Emilia became the first Italian city to have already defined, institutionalized, and regulated the Climate City Contract, drawing inspiration from what the EU Mission-cities are expected to develop in collaboration with local stakeholders.
The Regulation changes the institutional legal framework in Reggio Emilia. The city is divided into nine Areas, each represented by an Area Council. These Councils collect feedback on needs and problem areas before discussing and directly collaborating with the Municipality in order to develop public policies based on these needs and issues, as expressed locally. The dialogue between the Councils and the Municipal Services results in an Area Pact, which is a multi-actor Programme Agreement that defines the guidelines of the intervention to be shared among the area actors, which then becomes part of the Single Programming Document. The Area Pact guides interventions and is approved by elected bodies. Its implementation involves a joint design programme called the 'Community Laboratory' where the local community, stakeholders and the City Administration collaborate on innovative solutions for neighbourhoods. The projects are executed through the Partnership for Sustainable Development and Innovation, involving in the Laboratory different actors in line with the quintuple helix paradigm (public actors, research and knowledge institutions, for-profit entities, associations and Third-Party entities and even individual citizens).
In addition, the city is working within the circular economy framework, with a plant to convert organic residues into biomethane (Iren's FORSU). It has approved a Sustainable Urban Mobility Plan (PUMS) laying out significant and sustainable transformations in transportation and mobility habits. It is also active in urban forestation through the Natural Urban project for improving the microclimate and promoting adaptation to climate change.

4. Analysis and preliminary reflections

The information provided for each city is not comprehensive, since the cities undertake numerous initiatives, including minor ones. However, it offers an initial overview of the approaches adopted by cities to address the EU mission objectives. The table below highlights the key areas of cities' engagement: energy efficiency, circular economy and waste management, sustainable and shared mobility, urban greening, citizen engagement and social inclusion. As the table shows, cities are adopting a holistic approach towards sustainability, resource efficiency, and community involvement by integrating advanced technologies, circular economy principles, shared mobility solutions, urban greening initiatives, and citizen engagement strategies.

Fig. 1 - Summarizing table on cities' actions divided into key areas of cities' engagement
(Authors: Monica Bernardi & Alberica Aquili)

City	Energy Efficiency	Circular Economy and Waste Management	Sustainable Mobility	Urban Greening	Citizen Engagement and Social Inclusion	Other Initiatives
Bergamo	Waste management for district heating using residual undifferentiated fraction and other sources	Implementation of circular economy practices with a focus on reducing food waste	Expansion of railway infrastructure, creation of tramway line, promotion of sustainable, electric and sharing mobility, adoption of Urban Plan for Sustainable Mobility (PUMS),	Limiting land consumption through updated Territorial Government Plan	*Will be implemented in the CCC*	*Will be implemented in the CCC*

Bologna	Energy upgrading of public buildings and university buildings	Construction of "Power to Gas" plant, interconnection of energy systems, promotion of energy communities	Decarbonization of local public transport, completion of Biciplan, incentives for active mobility	LED lighting conversion, zero emission energy supply for public lighting	Engagement of citizens through Citizen Assembly for the climate, participatory decision-making process	Green Footprint, Digital Twin, City of Knowledge
Florence	Renewable energy promotion, energy upgrading of public buildings, energy grid improvement in collaboration with E-distribuzione, energy communities in public housing	Smart-street lighting, smart water management, smart waste management, circularity actions	Optimization of public transport, traffic supervision, increased electric mobility, adoption of smart city control room	Green urban areas projects incorporating Sustainable Land Use, Urban Forest	Engagement of citizens through Smart City platform and thematic groups, Participative paths for citizen proposals	Firenze Prossima program
Milan	Carbon neutrality plan, energy upgrading of public buildings	Creation of naturalistic oasis, sustainable tower, international hub for energy and sustainable mobility	Implementation of PAC to become a bicycle-pedestrian city, energy upgrading of public heritage buildings	Greening actions to reduce urban heat islands, urban green spaces, forestation	Participatory process involving citizens, associations, and businesses	Rotaie Verdi, Nido Verticale, Nuova Bovisa
Padua	Padua Sustainable Energy and Climate Action Plan	*Will be implemented in the CCC*	Sustainable Urban Mobility Plans (PUMS), Enhancement of public transport through smart system, new tram lines, promotion of cycle mobility	Green Plan, Implementation of green areas, Zero land use	Project "Padova SoftCity" for community strengthening and ecological smart city	Investment plans for strategic sectors
Parma	Carbon Neutrality Parma Territorial Alliance	Circular economy for waste sorting system	Green area to limit vehicle access, promoting cycling and sharing mobility, sustainable mobility	Improving public lighting with LED and smart lighting, Eco-City for urban regeneration at zero land consumption	Cultural leadership of Italian Cultural Capital award, Community bond for involvement of different urban actors	Real-time city management platform
Prato	PAESC-Sustainable Energy and Climate Action Plan, Next generation Prato, Actions for energy efficiency of public and private buildings	Textile recycling hub	Network of cycle lanes, Sustainable Urban Mobility Plan (PUMS), sustainable mobility governance	Urban Forestry Plan, Prato Urban Jungle, Sustainable urban agriculture	*Will be implemented in the CCC*	Smart City plan

Rome	PAESC-Sustainable Energy and Climate Action Plan, energy efficiency of the building stock (photovoltaic and solar), reduction of climate-changing emissions	Advanced waste collection and disposal tools	Sustainable mobility (Enhanced cycle network and revitalized public transport system)	Sustainable urban forestation	Vision of the "15 minute-city" based on proximity services	Increased smart working in public administration
Turin	Sustainable Energy and Climate Action Plan (PAESC)	Sustainable development policies	Sustainable urban mobility	Green urban planning	Collaboration with local stakeholders and research institutions	Sustainable and Resilient Turin 2030 Action Plan
Reggio Emilia	Reggio Emilia Municipality Energy Plan Institutionalized and regulated Climate City Contract for the realization of energy communities	Iren's FORSU plant of Reggio Emilia for the circular economy in Reggio Emilia territory to convert organic residues into biomethane	Sustainable Urban Mobility Plan (PUMS) approved by the City Council for significant and sustainable transformation in transportation and mobility habits.	Natural Urban, a project to implement the 'network' of trees in the urban area suitable for improving the microclimate and promoting adaptation to climate change	Quartiere Bene Comune program Regulation of Citizenship Laboratories and Citizenship Agreements Regulation on Democracy and Urban and Climate Justice Sustainable city living with less impact and collaborative governance Deliberative democracy and civic participation	Reggio Collaboratory Coviolo Wi-Fi Community City Science Iniziative

Working on these key dimensions to achieve climate neutrality by 2030, the ten cities are integrating the principles of technology, circularity, self-sufficiency, sharing and proximity into the smart city model. Their efforts are in line with those of the EU Mission: waste, circular economy, energy production and distribution, land, sustainable mobility and transport, sharing, lighting, citizen engagement. In general, cities are demonstrating a strong territorial focus, the ability to merge national and regional programmes with local projects to create synergies, the ability to maintain a cross-sectoral approach while ensuring coherence in policymaking principles and objectives. They are making efforts to introduce good governance arrangements, inclusive and responsive processes, as well as effective decision-making processes. Their approaches are also in line with the building blocks proposed by the Mission in the search for multiple funding sources, although the monitoring to quantify progress has not yet been clearly enunciated. On the other hand, the significance of citizens' engagement is widely recognized by our cities as crucial to creating a sustainable, equitable and inclusive model of urban development while mitigating environmental impact. As the literature states (among others: Alusi *et al.*, 2011; Goh, 2015), it helps in defining priorities, allocating scarce resources (Voorberg *et al.*, 2015) and leads to more democratic processes while serving as an intelligence-gathering tool (Tomor *et al.*, 2019).
Cities are already pursuing a multi-level, multi-stakeholder and participatory approach to governance as crucial strategies in jointly developing the Climate City Contract. Currently, only Reggio

Emilia has enshrined it in the Regulation but all the other cities are working on it within this governance framework. Nevertheless, in our opinion, the governance approach that best helps to overcome the limitations highlighted for each city model in section 1, is the one that sees the city as a shared urban benefit (Foster & Iaione, 2016). This is called the Co-City model and envisages participants, guided by principles of distributive justice, sharing resources, engaging in collective decision-making and jointly producing shared urban resources and services, supported by open data and technology. This model has been developed from the theories of Elinor Ostrom[18] and adapted to the urban dimension by Foster and Iaione (2016, 2019, 2022), that is, neighbourhood and community spaces, green areas, natural resources, streets, and historic and cultural assets, and neighbourhood or community services that are functional to local well-being and the satisfaction of needs related to city life (De Nictolis & Iaione, 2019). The authors developed an index to gauge the capacity of urban areas in implementing "the right to the city", fostering collaboration and innovation in cities through five design principles: enabling state, social and economic pooling, urban "experimentalism", technological justice, and co-governance based on the quintuple helix.

1) The enabling state denotes the role of public authorities as facilitators of collaboration with other urban actors.
2) Social and pooling economies involve civic enterprises operating alongside comprehensive economic ecosystems managed or owned by the community. Investing in collaborative, creative, and innovative economic models involve organizing resources to generate new employment opportunities and community services in complex neighbourhoods.
3) Urban experimentalism encompasses an experimental approach to urban processes.
4) Technological justice ensures equitable access to technology and digital infrastructure, sometimes managed by the community itself to develop neighbourhood services.
5) The quintuple helix represents the co-governance ecosystem, where public-private-community partnerships involve five types of actors: civic, social, cognitive, public, and private actor. These design principles make clear the factors required to depict the city as a cooperative/collaborative space capable of resource sharing, collective decision-making, and sustainable co-production of shared resources, encompassing environmental, cultural, knowledge, and digital assets (Foster & Iaione, 2016).

From our perspective, in order to truly transform cities into influential hubs of sustainable innovation and ecological transition while advancing their existing efforts, it is crucial to consider the city as more than just a common good. This means viewing the city not merely as governable (or better, co-governable), but as a shared resource with all the actors of the quintuple helix. This is what the aforementioned cities are trying to do, involving the civic actor (innovative communities and active citizens), the social actor (third sector organizations), the cognitive actor (cultural institutions, schools and universities), the public actor (public institutions), and the private actor (responsible companies and industries that build on local vocations).

The adoption of the Co-City model can help cities during the difficult transition to climate neutrality, since it deploys collaborative and polycentric governance for the co-management and co-ownership of a variety of urban assets and infrastructures, thanks to contractual or institutionalized public-community or public-private-community partnerships (Foster & Iaione, 2022). This is the key element for development at scale, empowering communities, giving people the management/ownership of assets/infrastructures. In our view, it is a kind of sociotechnical approach, through which technical possibilities can be explored from the perspective of social justice, and new ways of working with government and local communities to achieve sustainable communities.

18 Ostrom in her study of "collectively governed resources", proposed to abandon the 'state-market' dichotomy and move toward solutions based on institutions for collective action, featuring cooperation among users. Such cooperation has the peculiarity of following the principles of "institutional design" that allow the users of a shared resource to design, implement and monitor the rules for its governance (Ostrom, Hess, 2010).

Final Remarks

In the light of what has been described, it is clear that the approach of the EU Mission for climate-neutral and smart cities by 2030, as expressed in the selected cities' proposals, as well as by outsider cities like Reggio Emilia, is based on a reformulation of the smart city model by integrating principles of technology, circularity, sharing, self-sufficiency and proximity. The city models described embody different approaches through which cities try to respond to climate challenges in an urban context, gradually focusing attention on different aspects (technology, spatial proximity, self-production and self-reply to the needs of citizens, circularity, sharing and collaborative practices). All these dimensions are aimed at finding solutions to the increasing demand for food, water, energy, healthcare, housing, and transportation, exacerbated by climate change. The sectors in which cities are concentrating their efforts are in line with those indicated by the Mission: waste, circular economy, energy production and distribution, land, sustainable mobility and transport, sharing, lighting, citizen engagement. In particular, considering the cities' initiatives, we can see that *environmental sustainability* appears to be a primary focus, as cities implement waste management, renewable energy, sustainable and shared mobility, and green infrastructure initiatives. *Climate change resilience* is also crucial, encompassing resilient urban planning, disaster preparedness, infrastructure resilience, resource management. *Innovation and technology* play a significant role as cities embrace smart city initiatives, make use of open data and implement sustainable development practices. Finally, cities are also prioritising *social justice and equity* by addressing social inequalities, ensuring equal access to essential services, focusing on poverty reduction, education and healthcare improvement, affordable housing provision, social inclusion, and community engagement, along with the general adoption of multi-stakeholder and participatory governance approaches.

In terms of governance, cities are already implementing multi-stakeholder, multi-level participatory measures. The traditional top-down approach to governance is increasingly being complemented by participatory and collaborative models that involve multiple stakeholders, including citizens, businesses, academia, and civil society organizations. Nevertheless, no city has yet drawn up the CCC and the path is still long in order to meet the EU goals by 2030. In our opinion, the Co-City model could represent a valid approach to guiding cities in this mission by overcoming the difficulties highlighted in the various city models presented since it includes co-creation, shared decision-making, and collective responsibility, allowing for more inclusive and context-specific solutions. The five design principles (the enabling state, pooling, experimentalism, tech justice and co-governance) could help to boost the cities' commitment (and their results) in environmental sustainability, climate change resilience, equity and social inclusion, and innovation and technology.

Note that the contribution of this study to the discussion is mainly conceptual; from this first theoretical analysis, we can conclude that the Co-City model developed by Foster and Iaione encapsulates the EU requirements by helping the cities achieve the European goals by 2030 in a fair and just way (De Nictolis & Iaione, 2019).

However, further insights are required. In particular, the analysis could benefit from a more in-depth examination of the specific measures and actions implemented by each city to achieve climate neutrality and from an assessment of the impact and effectiveness of these initiatives in terms of the reduction of greenhouse gas emissions, resource efficiency, and social inclusion that also relies on quantitative data analysis. Further research might include interviews with city officials in order to gain a deeper understanding of the state of the art, strategies and governance of the cities. In addition, future studies might also delve deeper into the implementation of the Co-City model in practice, with a comparative analysis of case studies and evaluating the scalability and replicability of the Co-City model in different contexts.

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Silvia Crivello[1]

Energy transition and climate change in the contemporary urban era. A sociological point of view[2]

Introduction

It is a general consensus that the story of the development of human societies is a story of the transitions from one energy production system to another (Magnani *et al*., 2022).

The political issue of energy transition, and more in general, the concept of sustainability, emerged terribly after the 1970s energy-environmental crises, but these topics spread during the 1990s and the early 2000s, in a scenario characterized worldwide by a growing globalization and, for many countries, by a tendentially stable economic growth. Therefore, it was relatively easy to imagine sustainable development as compatible with economic growth and with forms of mitigation of the injustices generated by the neoliberal capitalist system. In the current scenario, reflection on energy transition and on sustainability can not ignore a severe recession of the economies of the Northern world, started at the end of the first decade of the 2000s, that is laying bare the problems of the capitalist system, indicating the unsustainability of the current development model and the need for a system change (Pellizzoni, 2021).

The quick succession of crises which have recently hit modern societies, and the world at large – financial, economic, austerity, refugee and migration, climate, COVID-19 – has exposed, more than ever, the social, economic, political and ecological vulnerability of consumer capitalist societies and the inability of current societies to move beyond their established 'politics of unsustainability' (Bluhdorn, 2022).

Ecological problems are, of course, nothing new but were part of all human history and they sometimes have led to the collapse of a particular society (Diamond, 2005). However, currently, global societies are increasingly confronted with potential disastrous crises on a global scale, and mitigation measures, until now, have not proven effective (Gorg, 2022).

The last report of the IPCC (Intergovernmental Panel on Climate Change) (2022), the main accredited actor at the international level for the study of the climate change problem, estimated that the average temperature of the Earth's surface has increased in the last century by 0.74°C, as a consequence of the augmented concentration of greenhouse gases. Greenhouse gases are the result of human activity, mainly fossil fuels and deforestation[3]. Beyond the thermal variation, the discourse on temperature easily evokes catastrophic scenarios connected to the reduction of glaciers, the rise in the level of oceans and seas, the expansion of subtropical deserts and the innumerable consequences on human life (Davis, 2010; Swyngedouw, 2013a).

Worries concerning the state of the environment are leading us towards a new so-called "carbon control" logic (Redclift, 2009; While, 2010), or rather a society that aims to limit energy consumption, to improve the use of cleaner forms of energy, to reduce emissions greenhouse gases (Bell, 2011; Hannigan, 2014; Spaargaren, 2003; Voss *et al*., 2006). Degrowth scholarship and activism call for and give a vision of this change, a "post-growth" ad "post-development" world, two umbrella terms that critique the centrality of economic growth and, more generally, the economy in contemporary societies, and embrace alternatives more ecologically sustainable ad socially just (Chertkovskaya, 2022).

This paper investigates the role that urban sociology can have in answering the energy problem in relation to climate change as one of the challenges perceived as most pressing for contempo-

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3 IPCC reports indicate that in next years the average temperatures of the earth will still rise: they estimate that the increase of grades compared to current values could be from 1.1 to 6.4 °C.

rary cities on a worldwide level. The aim is the promotion of critical approaches and innovative practices to protect the environment in relation also to problems as social justice.
The article is structured in three main parts: the first paragraph introduces the problem of the energy transition and frames it within the strategies of contemporary societies; it reflects on the urgency to pursue more environmentally attentive societies – compared to the current ones – and on the importance to reflect on the transposition of the concept of energy transition at the scale of the city. The second paragraph reflects on the relationship between energy transition, economic crisis of the cities and energy justice in relation to the scenarios of sustainability and climate-energy change. Finally, the concluding remarks underline how urban sociology, through conceptual and methodological tools, can help to understand the phenomenon of the energy transition and contribute to identifying possible solutions.

1. Theme and literature

The capitalist economy is inherently based on the principle of growth, that it exploits limited resources. This logic of profitability inevitably implies the instrumentalization and abuse of nature; the belief in the mastery of nature was, and still is, an important part of the cultural dimensions of the making of capitalist societies (Gorg, 2022). The mastery of nature lies behind the acceptance of limitless economic growth and technical progress as the only way to respond to the crises caused by economic growth itself[4].
The current environmental crises, from the climate crisis up to the loss of biodiversity and other ecological and societal crises dimensions worldwide, indicate a deep-rooted crisis of societal development as a whole, including its beliefs in science and culture, a crisis of civilization which requires a critical rethinking of history, society and nature (Gorg, 2022). Some authors diagnose a crisis of civilization in which societal and environmental issues are inextricably interlinked (Lang & Mokrani, 2013; Kothari *et al.*, 2019).
In the face of the deepening social and ecological crises, which call for an encompassing social-ecological transformation of the capitalist mode of production and living (see Brand & Wissen, 2017, 2021), it is pivotal to theorize the interdependencies between societal and environmental issues, to rethink capitalist development and to elaborate on the emancipatory dimension of this challenge (Grog, 2022). The construction of a society more attentive to change climate requires, in fact, far-reaching changes that involve very different fields (Beck, 1986; Agustoni & Maretti, 2012;): it means for instance, changes in behavior and habits, from culture to food, from transportation to social justice (Chatterton, 2013; Osti, 2012). From this point of view, for example, Raymond Murphy discusses how social practices involve the integration between three elements (materials, meanings and competences) into performances: social practices are, of course, involved in their physical context – which is changing because of global warming – but they also impact the environment because materiality is an indispensable element of which socialness is made (Murphy, 2021). Another relevant aspect, at the heart of this reflection, is the urban dimension of the problem; in the energy transition the role of urban centers appears crucial and the urban scale is, progressively, chosen as the site to experiment with innovative solutions to tackle the climate crisis (Bulkeley & Castan Broto, 2013; Pellizzoni, 2021)[5].
It is widely recognized, both by urban experts and international institutions, that the twenty-first century is the urban century: since 2007 the majority of the population of the world lives in cities

4 Even after decades in which an awareness of these crises has slowly risen, the idea of mastery of nature is still effective and deeply rooted in the quest for technological solutions and economic innovations expressed, for example, by approaches of ecological modernization (see for example: Asafu-Adjaye & Mahadevan, 2013; Hajer, 1995).

5 The New Urban Agenda of the United Nations (2017) recognized the crucial role of cities in tackling global issues such as climate change. Specifically, the Sustainable Development Goals (SDGs) directly refer to 'sustainable cities and communities' in Goal 11: 'Make cities and human settlements inclusive, safe, resilient and sustainable'.

and, as stated by the United Nations, between 2009 and 2050, the population of urban areas will grow from 3.4 to 6.3 billion, absorbing most of the increase of the world's population (UN 2010). The growing strategic importance of urban space concerning both the problem's definition and its solutions isn't certainly new in the current economic scenario. Since the last century, cities have been the spaces of the biggest changes due to the conditions imposed by globalization and neo-liberalization. Cities have been forced to become more entrepreneurial and more competitive in attracting – or retaining – mobile capital and in diverting resources from social welfare to economic development (Harvey, 1989; Jessop, 1997; Peck & Tickell, 2002). With the so-called «new urban policy» (Cox, 1993), cities started to be involved in the global competition to attract investments, moving from a broad concern for the management of public goods (including the environment) to an ever more pressing alarm for economic competitiveness, often with negative consequences for the environment. The rule of the market is basically incompatible with the principles of equality and the capitalist economy isn't oriented towards social needs but driven by the imperatives of growth and profitability (Gorg, 2022).

Urban activities are responsible for 80% of carbon dioxide emissions produced globally each year and for 75% of the energy consumed due to the concentration of population (UNEP, 2017)[6]; urban centers are the places that have the greatest influence on global pollution.

In addition to constituting the main polluting spaces, cities represent also the main victims of climate change, exposed to «natural» disasters such as floods, hurricanes, energy blackouts, etc. (Davis, 2010; Swyngedouw, 2013a). Not surprisingly, the debate on the so-called "urban resilience" is receiving a particular emphasis in terms of analyzing (and promoting) the ability of cities to recover and to adapt in front of disasters and massive environmental, economic, social pressures (cf. Newman *et al.*, 2009; Pike *et al.*, 2010; Simmie & Martin, 2010; Vale & Campanella, 2005).

Cities are seen as the contexts where to experiment with new technologies related to energy, water, mobility, etc. thanks to the concentration of people, goods, and information (Hodson & Marvin, 2009) and relevant as spaces for the governance of climate and energy change: in an era of globalization and of intense competition between places, cities represent the new spaces of the relationship between national governments and their territories, within multi-scalar governance (Brenner, 2004).

At the same time, cities are also active places for the contestation of the current globalization and the mobilization promoting sustainability. Social movements against climate change and supporting environmental justice (such as the Indignados, the Occupy Movement and the Friday for Future Movement) are typically urban phenomena (Rossi & Vanolo, 2012; Hannigan, 2014; Asara, 2016; Kaufer & Lein, 2020). Energized by these crises, social movements have promoted post-growth (Latouche, 2006), degrowth (Kallis, 2018), post-capitalism (Mason, 2015), environmental justice (Schlosberg, 2007) and other notions for a more ambitious reframing of the ecological issue and as new concepts for a transformation of modern societies beyond their logic of exploitation and inequality.

Mainly for these reasons a new «low/post-carbon» political rationality based on accountability towards the environment seems to emerge and grow but what this means about urban policies is still an open question (Blowers, 1997; Hajer, 1995; Spaargaren, 2000).

2. Some results concerning the relation between energy transition and sociology

The transition to cleaner forms of energy doesn't include technological configurations only. Energy systems are, in fact, socio-technical systems (Miller *et al.*, 2013) which involve not only infra-

6 UN Environmental Annual Report 2017 : https://www.unep.org/resources/un-environment-annual-report-2017

structure, machines, mechanisms and devices, but also a much more multifaceted complex of features as, for example, companies, consumers, relationships, politics, science, etc.
Analyzing energy changes through the lens of the socio-technical systems allows to see important aspects neglected in many analytical approaches. This lens shows how social processes stimulate and manage energy transformations; changes in energy technologies, in turn, reshape social practices, values, relationships, models of business, forms of work, ways of thinking and living (Miller *et al.*, 2013; Crivello, 2015).
Sociology can offer a wide range of tools to understand the different geometries of power and strategic interests underlying the creation of coalitions of interests, economic rationalities, urban development strategies in a scenario of global crisis.
This perspective relies, for example, to the recent debates on urban metabolism and on the so-called «urban political ecology», aimed at overcoming the hypothetical ontological division between nature and society (the myth that cities are places «where the nature stops», Hinchcliffe, 1999) and to highlight the role of capitalist processes in the reproduction of the environmental problem (Cook & Swyngedouw 2012; Henderson, 2009).
From a theoretical point of view, developing conceptual tools allow us to understand a series of heterogeneous quantitative and qualitative processes (human and non-human), dynamic, interconnected and constantly negotiated and renegotiated between social forces. These processes assemble and re-assemble human and non-human subjects in changeable and unpredictable urban forms: material elements, such as water or oil, are transformed under the action of capital and labor guided by capitalism and surplus extraction (Cook & Swyngedouw, 2012; Gandy, 2004). Understanding such mechanisms requires knowledge and sensitivity close to sociology, but pushes also sociology to confront and hybridize with the strictly «technical» and «engineering» knowledge, essential to understanding the nature and the mechanisms of ecological processes typical of the urban metabolism theory (cf. Padovan *et al.*, 2011; Pellizzoni, 2011).
A sociological analysis of the discourse on energy transition and global change can offer critical perspectives for broadening the interpretative horizon and for questioning «conventional knowledge» that usually limits understanding and intervention; sociology traditionally does not contribute to the quantitative approach of these models, while it addresses the most qualitative aspects.
It's relevant to remember that, since the models about the resources' limits outlined in the 1972 well-known Club of Rome report, the scientific debate, strongly focused on quantitative models, has evolved. These models design future scenarios and, even if they raise inevitable doubts and perplexity among various scholars (Castel & Henderson, 2003; Hulme & Mahoney, 2010; Schiermeier, 2010), they are useful tools for monitoring and reflecting on the evolutionary dynamics of society.
Avoiding the excessively relativistic and constructivist positions, and the haze of the actual reality of the problem too, sociology can reflect on the different rationalities and perspectives grounding these scenarios (i.e. on the diverse epistemologies of global change). For example, the link between energy consumption and the imaginary of the «ecological disaster» is often missing in the technical debate. Many reflections outline the risk of a possible apocalyptic future marked by ecological disaster, a future often described in many recent sci-fi films (e.g. The Day After Tomorrow). This suggestive and troubling imaginary often seems to support the search for solutions to emergencies (e.g. urban technologies able to counteract the rise of the oceans), without questioning the economic model and the lifestyles they are producing. Shifting attention to the analysis of the environmental impacts of production to consumption practices would be a relevant contribution (see for example the works by Carolan, 2004; Spaargaren & van Vliet, 2000).
In social studies, the assumption is that disasters are never entirely "natural" but the destruction's extent depends on the socio-environmental characteristics of the city affected by the disaster. Murphy (2004), for example, investigated the case of the well-known "natural" disaster in New Orleans, underlying that it was not «natural» that the disaster mainly affected the black population, who lived in dilapidated neighborhoods and who was unable, without a private car, to

avoid the hurricane (cf. Allen, 2013; Campanella, 2006; Keil, 2007; Peck, 2006). Tragedies aren't indiscriminately «global» and their impacts are strongly local and socially differentiated.
Then, the catastrophe doesn't seem to be "natural", but strongly "social" related. The differentiated impacts of climate change can reinforce already existing social and economic inequalities and create new vulnerabilities. Also, the COVID-19 virus has reflected social inequalities, with the less privileged groups both more exposed to it and more affected by it.
How can sociology contribute to a reflection on energy justice? Starting from the social justice's debate, it is possible to develop some interpretative strategies for an energy justice's agenda. This process would assume equal access to energy sources, fair distribution of costs, benefits and risks, and unanimous participation in choosing whether, where and which energy systems to build (Miller, 2012), with reference to both production and consumption, from the local scale to the global one (on the issues of environmental injustice on a global urban scale see, for example, Osti, 2013); according to some scholars (O'Rourke & Connolly, 2003), distribution, use and impacts of energy production are largely unequal, as political and economic benefits.
A crucial topic is "who" has the right to choose. Citizens and communities often have different perspectives compared to industries and policymakers about how, where, if, and when to build energy systems. In addition, conceptual frameworks often operate favoring the ideas and values of certain groups, marginalizing the perspectives of those who are at the bottom of the social ladder and, for example, they do not have adequate cognitive, cultural and economic resources to respond.
Energy systems often create inequalities in the distribution of damages and benefits too. As already highlighted in many environmental justice's debates, dangerous pollutants are often concentrated in places where live groups with little political power live, while the strongest energy consumers often live without exposing themselves to environmental contamination (on issues of environmental conflicts see Bobbio, 2011; Pellizzoni, 2011). The growing anxiety about the increasing cost of resources, gas security, and oil supplies (Newman *et al.*, 2009) can justify and legitimize the state of power and control's extension (Swyngedouw, 2007). Over time, this process can help to create or reinforce unequal distributions of power and well-being in industrial societies. This leads to important questions: who will control the access to renewable energy in the 21st century? Who will benefit from the new energy systems? Who will lose? And whose life and livelihoods will be at risk?

3. Conclusions and limitations of the research

Certainly, as it has been argued in this article, energy transition and global climate change are recognized today as the greatest challenges of the twenty-first century. The promotion of an ecological transition, in this sense, implies composite and multi-faceted processes, socio-technical changes and considerable changes in fields of investigation of sociology as habits, behaviors, uses and lifestyles. Issues concerning the energy transition towards lower environmental impacts have, in the last decades, acquired wide importance within the academic and political debates (Chatterton, 2013; While *et al.*, 2010; While & Whitehead, 2013). The reflection on the energy issue and climate change is characterized by a variety of possible epistemologies, scientific approaches and methodological tools; therefore, difficulties of dialogue between different voices are common.
If ecological and energy problems constitute a stark reality – and a multitude of scientific approaches are aimed at quantification and understanding the complex mechanisms of ecological and anthropic systems (cf. Mol & Spaargaren, 2000) – from a strictly sociological point of view it is possible to highlight the multiplicity and heterogeneity of the positions and arguments brought up by experts, politicians, activists etc. (Hoffman, 2011; Nisbet, 2009).

For instance, there is still a large discussion about the quantification of the problem: alarmist positions are opposed to more optimistic ones, and for social scientists (and non-experts of ecology and, more in general, for people without a specific and technical knowledge), it is very difficult to have a clear opinion in front of the data technicality.
This paper doesn't want to support unconditionally constructivist positions in the sociological vision of the problem but, on the contrary, it tries to stimulate a dialogue between sociology and 'technical' knowledge.
More specifically, in the scientific debate, two expressions assume particular importance: the first refers to the idea of a "low-carbon" transition (Hodson & Marvin, 2012). In a nutshell, the goal of this transition is the promotion – for example through technological innovations or market economic instruments – of structures and forms of social and industrial organization with a lower energy and environmental impact. Programs to promote renewable sources or tools such as the mechanisms of tradable emission permits belong to this group.
The second expression refers to the idea of a society not only «low-carbon», but more radically «post-carbon» (Heinberg, 2004; Lerch, 2007). In this case, (and similarly to other social science concepts that use the prefix «post»), the idea is to reverse the perspectives of socio-technical progress, wondering about possible radically different societies, able to free themselves from the use of fossil fuels. The reflections on degrowth made by Latouche (2006), or critical theories carried out by post-development scholars (see, for example, Sidaway, 2007) belong to this second group. According to these authors, the debate on sustainable development and on low-carbon transition has taken on extremely modest tones and conservative objectives: the main goal seems to be the search for minimal adaptations to our socio-technical-economic system that they allow to avoid ecological disaster. In this sense, the search for sustainability becomes comparable to a sort of "ecological modernization" process (Hajer, 1995; Mol, 2003; Spaargaren, 2000; 2011) aimed at finding technological and technical-managerial solutions to make more efficient the system but without really questioning it (a sort of "greenwashing" operation, to use the words of the young activist Greta Thunberg). Differently, authors such as Daniel Lerch (2007) propose to cancel definitively the use of fossil fuels. Lerch's solution consists of a reorganization of cities to self-contain flows of materials, energy and waste through the recovery of local knowledge and austere lifestyles, focused on the principles of recycling and energy saving. Even more radically, authors close to post-development debates doubt about the assumptions of neoliberal capitalism and consumerism (Escobar, 2010; Swyngedouw, 2013b).
In proposing a reflection on the role of sociology in this framework, this article focused specifically on aspects of the problem closely related to the issues and theories developed within urban sociology and urban studies.
In particular, the energy-environmental issue developed reflecting on its eminently urban dimension, on the socio-cultural scenario affected by the economic global crisis, the multiplicity of possible epistemologies that can be employed in the construction and interpretation of the problem, on the possible developments of a reflection on socio-energetic justice. It is precisely in this sense that sociology can offer its contribution: problematizing the question and highlighting the complex relationships between social facts and environmental ones, between space and politics, and between knowledge production and critical knowledge.
Developing such approaches does not imply abandoning the sociological theoretical tools to face complex technical and ecological issues, but it rather supposes the construction of an interdisciplinary dialogue that intersects sociological analysis with "expert" engineering and economic knowledge, as evidenced by urban metabolism approaches and urban political ecology approaches.
As discussed in this article, to understand the complex challenges of the energy-environmental issue is of primary importance trying to overcome the use of simplistic conceptual categories, for example, based on the contrast between «nature» and «society» or on the adoption of strictly constructionist visions of the phenomena.
In this difficult path, the goal is not only the promotion of critical approaches but, more pragmatically, to construct critical sociology aimed to understand and learn from those social forces

that already exist and that are building innovative practices in defense of the environment and of social justice.
In pandemic and post-pandemic times, it is the task of critical scholars to continue analyzing those initiatives through a critical lens, not only to show their contradictions but also to imagine opportunities and innovative frameworks that would allow for a progressive urban socio-environmental transformation that does not leave anybody behind; this brief reflection should not be considered as a real research agenda proposal, rather than an invitation to build an Italian debate on the theme.

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Alessandra Terenzi[1]

Climate change and social inequalities: the gap between climate solutions & environmental justice[2]

1. Introduction. From climate solutions to climate exclusion

The Davos World Economic Forum (2023) confirmed that Climate risks and social inequalities are two sides of the same crisis. Inequalities represent one of the greatest obstacles to sustainable urban regeneration in smart cities, for a real equitable future based on a neutral climate scenario.

Therefore, it is unthinkable to believe that we can tackle the climate crisis while ignoring the issue of inequalities, as the benefits achieved on one front could be neutralized if we do not simultaneously act on the other.

In fact, as Therborn argues, inequality represents a violation of human dignity; the negation of any possibility for each person to develop his or her abilities. According to Therborn, inequality has several consequences and takes different forms: premature death, poor health, discrimination, exclusion from knowledge, subordination, poverty, humiliation and segregation from where social life predominantly takes place, lack of self-confidence, powerlessness and lack of possibilities and opportunities in life. So, it's not just a matter of the size of one's wallet. Rather, it is a socio-cultural structure that suppresses one's abilities, any resources to participate fully in social life, as well as self-respect and sense of self (Therborn, 2013).

The fight against inequalities, within and between states, therefore represents one of the main 17 objectives of the "2030 Agenda for Sustainable Development".

Simultaneously, several studies on the placement and role of the Anthropocene within the discourse of today's crisis show that humanity's impact on the planet and its contribution to climate change, while certainly not new phenomena, had never been so rapid in time and with such devastating consequences (Pievani & Varotto, 2021). Considering these changes, the effects of the climate crisis could risk becoming true multipliers of all the forms of social and economic inequalities that already exist, expressed through parameters such as class, ethnicity, gender, age, income, etc. The resulting complex, often overlapping, pluralities lead to the creation of new social identities, characterized by significant intersectionality and increasing inequality - at the level of vulnerability - between different communities and people. This process of rapid change, combined with the enhanced intensity and frequency with which drastic weather events are expected to occur soon, will dangerously increase the risk of causing irreparable political, economic and social damage. Issues related to climate justice, therefore, nowadays assume a central role in the process of ecological transition and in the implementation of climate policies.

This study proposes to apply a critical reflection of these theories, demonstrating the inseparable correlation between fragile areas/populations and the impacts of climate crises through the selection and analysis of some case studies referring to Genoa, an historically polycentric city, shaped by multiple centralities and peripheries. This study will also allow to consider some dynamics and theories generally projected on a global scale of reference, by experimenting them on a local/urban scale, considering the several and profound differences existing within the same city.

This research aims thus to demonstrate how the fight against social inequalities could represent a concrete opportunity to think about new theoretical paradigms in a neutral climate scenario toward an actual equitable ecological transition, opening new possibilities for sustainable urban regeneration in smart cities. The paragraphs below will be structured as follows: paragraph n.2

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will investigate theoretical literature referred to the mutual influence between urbanization processes, climate change and inequalities, as well as between power domination and submission; paragraph n.3 briefly traces the methodological approach, even assuming some insights related to possible future work; in paragraph n.4, the theories analyzed and proposed in section 2 will be applied and investigated for some specific contexts in the city of Genoa; in section n.5, some insights will be proposed with respect to the definition of possible future scenarios related to environmental justice.

2. Theme and literature. Environmental crisis as social injustice

2.1 A world split in two

In 1936 Keynes, in his publication on the "General Theory of Employment, Interest and Money", explained that capitalism had resulted in an arbitrary and unfair distribution of wealth (Keynes, 1936). Almost 90 years later, that observation is even more dangerously topical: the last Oxfam report (Christensen, 2023) reveals that, for the first time in 25 years, extreme wealth and extreme poverty have increased simultaneously. Over the past decade, the number and wealth of billionaires has doubled, with the top 1% having captured approximately half of all newly generated wealth. Since 2020, at the beginning of the pandemic, the same richest 1% captured about $26 trillion, that is to say 63% of all new wealth, almost twice as much as the amount of money that went to the 99% of the entire remaining world population put together and 2020 is likely the year with the largest increase in poverty since World War II (The World Bank, 2022).
In addition, the current severe climate crisis, having recorded peaks unique in history in the last two decades, is affecting the globe in its entirety, causing incalculable damage particularly in certain geographic regions through an inextricable intertwining between climate crisis and the growing economic and social inequalities. Indeed, global warming is, by definition, a phenomenon shared by all humanity: greenhouse gases accumulate in the atmosphere and raise the average temperature of the Planet, regardless of where they are emitted. Yet, the most vulnerable segments of the population start at a disadvantage.
These *environmental inequalities* are caused by the absence of *distributive justice* whereby environmental risks are not shared equitably, as evidenced by numerous studies showing that extreme weather events always tend to fall on disadvantaged and very poor areas of the world, which are characterized by the worst macroeconomic data and greater vulnerability and subjection to climate risk, and which suffer proportionately greater economic losses than more economically advanced geographic settings (Eckstein *et al.*, 2021). Moreover, these places more frequently see a confluence of *direct damages*, caused by the physical manifestation of climate change, such as sea level rise, drastic weather events, heat waves and forest fires, with *indirect effects,* such as crop loss, migration, and increased civil unrest, threatening the livelihoods of millions of people.
The U.S. Environmental Protection Agency Report (Epa, 2021) shows that, in the territories identified as most affected by the various consequences of the climate crisis, there is a particular concentration of vulnerable people characterized, more specifically, by low-income people, ethnic minorities, the elderly or people with less than a high school diploma.
Inequality in carbon production can be read as a mirror of extreme income and wealth inequality. Indeed, emissions are produced disproportionately by people in wealthier countries who generally live carbon-intensive lifestyles, resulting in an unequal global distribution:
through their polluting investments, the wealthiest billionaires are individually emitting carbon equal to a million times in more than the average person (Maslennikov, 2023). The richest 1% of humanity is responsible for twice the emissions of the poorest 50%. By 2030, their carbon footprint will be 30 times higher than the level defined by the Paris Agreement, corresponding to the limit of 1.5°C. Nevertheless, the climate crisis caused by the richest 1% of the world's pop-

ulation is having devastating effects mainly on the poorest, who bear the least responsibility by far (Maslennikov, 2023).
A recent study titled "Impacts of poverty alleviation on national and global carbon emissions" (Bruckner *et al.*, 2022), demonstrated that eradicating extreme poverty, affecting hundreds of millions of people who live with less than US$1.9 a day, would result in a rise of global carbon emissions of less than 1% and would have no impact on ongoing climate change. All of this means that the global carbon budget is being rapidly depleted not to ensure a decent way of life for all of humanity, but to enable a minority of the over-rich to consume more and more.
In addition, the issue related to CO2 production highlights another fundamental aspect, whereby it is not only climate change that is identified as a profound cause of inequality, but also the eventual "climate solutions" that, while for certain areas will lead to a low-carbon economy, for the most affected areas and populations will turn into *climate exclusion*.
This is the case, for example, of many poor african countries which are marginalised and left on the sidelines of any kind of international negotiations in climate summits regarding environmental policy, thus leaving climate justice out of the equation. This racism and white supremacy policy of exclusion has also emerged during the recent COP26, which many african delegates and activists were unable to attend due to a lack of vaccines and funding available for African countries (Williams, 2022).
The "*Global Risks Report 2023*" produced by the World Economic Forum (WEF, 2023) places climate issues at the top of the list of the main perceived long-term risks in 2022. Yet, as noted in the Report, it is impossible to ignore short-term risks, related to the overall cost-of-living crisis, where millions of people suffer from hunger and thirst every day and many find themselves displaced, homeless or continuously exposed to risks of violence; moreover, many families are forced to choose between food and heating every day, in extreme climatic conditions. Similarly, many governments are now forced to choose between financial default and heavy cuts in education, health care and infrastructure. Within this framework social, economic and even energy inequalities are being exacerbated.

2.2 The unequal distribution of natural resources: between power domination and submission

The Planet is one, but there are those who push it toward (?) climate catastrophe and those who, instead, merely suffer. The human population, while growing everywhere, employs highly differentiated shares of natural capital to survive, depending on where they live. In fact, the absence of distributive justice with respect to environmental inequalities, is directly linked to an unbalanced distribution of natural resources, as revealed by the analysis of Pellizzoni and Osti, who identify the temporal, social and territorial as the three main dimensions of imbalance (Pellizzoni & Osti, 2008).
In terms of the *Temporal Dimension*, the availability of natural resources is not only related to a static mapping of their geographical distribution, but is also the product of progressive modifications and adaptations of the natural environment, introduced by humans over centuries of colonization: humans themselves have moved around, thickening in coastal or more fertile areas, irrigating some areas or impoverishing others, reclaiming, desertifying, building mines to extract raw materials, exporting crops, products, animal species, farming methods and more. All these have made profound and successive changes with respect to the degree of biological complexity (*Climax*) of different areas. The temporal dimension thus draws on a reading of the ecological crisis developed primarily from a geo-historical perspective, as is also clearly evident in the numerous writings of influential French historians from the École des Annales, including Lucien Febvre, Fernand Braudel, Henri Pirenne, and Jacques le Goff.
With respect to the *Social Dimension* of the environmental crisis, as much as it affects a planetary scale, through a socio-economic reading of the different cases, a wide range of local case histories emerges, relating, for example, to the presence of immigrants included in circuits of danger-

ous workings, workers who are seriously ill or who die from contact with harmful chemicals. In fact, all this shows how the prospect or otherwise of protecting oneself from possible environmental hazards and access to natural assets is by no means a right of everyone, but only of those who can afford more effective and costly protection strategies.
In this regard, Therborn (2012) identifies three main types of inequality, which could be traced back to the social dimension: *life expectancy* (expressed by indicators such as mortality, life expectancy and health); *existential inequality* (directly related to respect, dignity, humiliation and freedom); and *inequality in access to and distribution of resources*, directly related to each person's wealth or poverty.
The third and final dimension of the ecological crisis enunciated by Pellizzoni and Osti is the *Territorial Dimension*, which refers to a mainly geopolitical key, expressed through the concept of *environmental injustice*. According to this principle, the ecological well-being of one area would turn out to be functionally linked to the malaise of the other, starting with an unequal distribution of natural goods. One need only think of areas in so-called *ecological deficit* that, although they have good financial resources, do not have sufficient ecologically productive land relative to the needs of their population (*ecological footprint*), which they then satisfy through the import of natural resources from contexts that are generally in the opposite situation, defined by high biological capacities and scarce economic resources.
This free trade in raw materials between countries with disproportionately different financial capacities takes place in totally inequitable ways, whereby rich countries impose bargain prices of purchased goods by increasing their profit margins, making their equities more attractive and thus attracting additional capital. The same prevaricating countries, moreover, after diverting energy, dump waste from polluting or risky processing or stages of production into poor countries: just think of the areas where hazardous and radioactive industrial waste is disposed of, through the construction of landfills and incinerators, rather than the areas chosen for the establishment of factories, power plants and more: these are always second-class areas, already disadvantaged and inhabited by fragile populations, where the damage of extreme weather phenomena is also compounded by the serious effects of industrial pollution.
Inequitable exchanges, historically rooted in the framework of colonial asymmetries occurring between the North and South shores of the Mediterranean, offer a striking example of such dynamics, where globalization has generally been interpreted as an aggregating force aimed at overcoming barriers and geopolitical conjunctures through the creation of a new order, capable of producing horizontal networks of exchange between countries. However, the alleged homogeneity and unity of the Mediterranean space is a debatable fact. The countries on the "southern shore," in fact, supply the EU only with low-value-added primary goods, such as hydrocarbons, phosphates and agricultural products, and host relocated European industrial plants. EU countries, by contrast, export high-value-added agribusiness and finished industrial products, such as automobiles, to the "south shore" countries. The paradox is that Moroccan phosphates imported into France are used to produce the chemical fertilizers that the European agribusiness industry needs to re-export its food products to Morocco, thus closing the loop (Terenzi *et al.*, 2015).

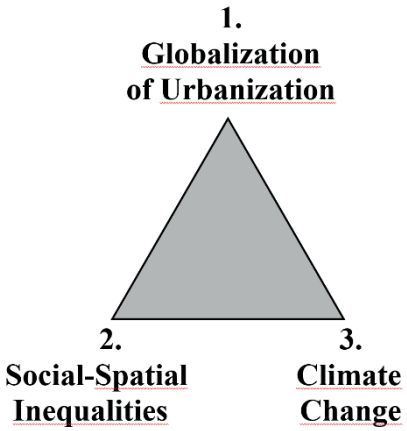
2.3 A dangerous Triad: Globalization of Urbanization, Inequalities and Climate Change

> You have left us standing on the edge of the precipice, facing multiple and interconnected crises. Climate catastrophe. Unjust debt. Global inequality and poverty. Hunger. Biosphere and ecosystems collapsing. (...) You offer us nothing but bitter and poisoned tears, but we will not let you sacrifice us for profit. We fight for a world where everyone has the right to live with dignity and in harmony with the planet. For us, justice matters. Human rights matter (Rehman, 2022).

The vulnerability of cities to the effects of climate change and to the consequences of extreme events presents higher levels of intensity, due to their high population density, greater institutional complexity, and high rate of anthropization and land development (Spano *et al*., 2020).

It is always cities, moreover, that are identified as privileged epicenters where the most violent phenomena of social inequalities and polarizations are born and nurtured, whose dangerous increase that has been occurring for several decades is directly linked to a process of globalization of urbanization that cities have been facing, characterized by an infinite encroachment of the urbanized, up to the deepest rural areas.
However, as highlighted by Bergamaschi and Lomonaco (2022), this process, which affects territories and cities at a global scale, does not result in a spread of homogeneous and smooth spaces. On the contrary, "territorial differences within and between cities do not disappear; if anything, urban contexts are crossed by processes that contribute to their further stratification and to a multiplication and articulation of their differences" (Bergamaschi & Lomonaco, 2022: 18).
Thus, according to Soja, this infinite encroachment of the urbanized requires new and diversified keys, proposing in this regard a spatial theory of justice (Soja, 2010), based on a critical spatial perspective that shapes the multiple multiscalar geographies in a complexity of relations of domination and subordination, shifting attention "from spatial manifestations of injustice to structural dynamics that produce and reproduce injustice *through space*." (Dikeç, 2009: 1).
The mutual influence between social and spatial injustice causes a clear distinction between pockets of wealth and pockets of poverty, reflecting different levels of accessibility to resources and opportunities (Filion and Keil, 2017).
In such context of global urbanization, the political organization of space represents the main source of spatial injustices, caused by exclusionary zoning processes and by the downsizing of investments in some areas, condemning them to social polarization, lack of opportunities, low quality of life, low income, housing suffering and inadequate services and connections and preventing the development of new local policies based on sustainability solutions for the whole community.

Fig. 1 (Author: Alessandra Terenzi)



These reflections could prefigure a triad (fig.1) defined by three main interconnected factors having at the apex the process of globalization of urbanization (1), which has been going on for several decades now. The process of unstoppable global extension of the *urbanized* can undoubtedly be considered one of the main causes related, on the one hand, to the exacerbation of the phenomena of socio-economic and spatial inequalities (2) and, on the other hand, to the rapid worsening of the devastating effects caused by climate change (3).
Moreover, inequality and climate change are not independent and unrelated phenomena but, on the contrary, feed off each other. In fact, the complex relationship between climate change and inequality, identified as a now constitutive element of the contemporary economic system

and globalized capitalism (World Inequality Report, 2022), unfolds on two dimensions: on the one hand, the disproportionate increase in economic and social inequality in recent decades, represents the greatest obstacle in addressing climate change and one of the main causes related to the worsening climate crisis; on the other hand, conversely, the increase in inequality also represents one of the most serious effects of recent climate change, which systematically affects the vulnerable segments of the population most severely (Carraro, 2021; Ronchi, 2021), leading some scholars to argue the existence of an inherently *racist dimension* of climate change (Williams, 2022). Inequality and the consequences of climate change, then, represent the two main faces of the same challenge - currently the most important one to be addressed - related to sustainable and inclusive development that considers all countries and all individuals. In this regard, the reflection could also be extended on how to update the historical Lefebvrian notion of "droit à la ville" into "droit à l'environnement" by thinking both at the level of "espace perçu" (perceived space) and "espace vécu" (lived space).

3. Methodology

This contribution has been developed through several stages of work and research experiences, mainly elaborated through a plan of theoretical inquiry based on a thorough literature review. From these theoretical references, a series of critical reflections were constructed with respect to issues such as environmental justice, social inequalities, climate exclusion, ecological transition and the global climate crisis.
The investigation was also accompanied by an empirical dimension of the research, referring to a series of selected contexts in the Genoa area aimed at spatializing some of the main conceptual interpretations proposed in the theoretical part. The distributive injustice of environmental inequalities in Genoa was thus investigated through three main dimensions: temporal, social and territorial (Pellizzoni & Osti, 2008), reporting each dimension with respect to a series of specific cases. Each case was also reported to the triad proposed in section 2.3, relating to the correlation between globalization of urbanization, inequality and the effects of the climate crisis.
The empirical part of the research was developed through a work characterized by field missions to some of the examined areas. The fieldwork was flanked by several interviews conducted with privileged actors, involved at the institutional level in the government of some municipalities of the western side of the city (Genova Ponente) and expert *connoisseurs* of the realities under study (Valpolcevera, Medio Ponente, Cornigliano and Sampierdarena) as well as by a direct involvment and participation as full member at a non-profit association born recently (2022) operating in Cornigliano with the local community.
In a possible subsequent phase of in-depth research, at the methodological level it would be interesting to create *ad hoc* mappings on environmental inequalities through the use of specific software (e.g. ArcGis), spatializing the correlation between socio-economic inequalities and areas at risk for climate crisis. This would make it possible to lay the groundwork for the construction of an *Environment-Disparity Observatory,* specialized in the collection and integration of socioeconomic and environmental data, which would make it possible to develop comparative analyses of different local impacts and define potential action lines.

4. Results. Genoa: between multiple centralities and environmental inequalities

4.1 The Temporal Dimension: building speculation and morphological structure

According to the *"Global Climate Risk Index 2021"* (Eckstein *et al.,* 2021), Italy is among the countries most affected in the world by extreme events, which increase in intensity as the Earth's average

temperature rises. From 2000 to 2019 Italy ranks 6th on a global scale for the average number of deaths caused by climate change, recording nearly 20.000, 9th in fatalities per 100.000 inhabitants, 12th in losses in million US$ (PPP purchasing power parity) and 99th in losses per unit GDP (Eckstein *et. al*., 2021).
These data confirm that the climate emergency is the real priority of our Country. Nevertheless, unlike many other European countries, Italy's National Plan for Adaptation to Climate Change (PNACC) has been at a standstill since 2018.
In addition, Italy from 2013 to 2022 has spent more than 13 billion euros on the management of weather and climate emergencies, almost four times the money spent on prevention, which, on the other hand, if properly enhanced, would save 75% of the resources spent on emergencies (Nanni & Minutolo, 2022). This is an increasingly central issue, considering that the ordinary government of the land is increasingly intertwined with a necessary extraordinary government of the unexpected, making it necessary to rethink the relationship between the two approaches in terms that are no longer dichotomous, but more integrated (Weick & Sutcliffe, 2010).
At the local level, only a quarter of Italian cities have completed a climate risk and vulnerability assessment, and only 12% have approved a Climate Change Adaptation Plan (Ronchi, 2021; Carraro, 2021).
Genoa has recently endowed itself with a planning tool with a vision to 2050 – *Action Plan Genoa 2050* – containing three main action strategies, called Grey, Green and Soft, with short, medium and long-term results and impacts, aimed at environmental sustainability, adaptation and mitigation of climate change, as a function of improving the quality of life of inhabitants. The Climate Change Adaptation Strategy (Sracc Liguria, dgr n.18/2023) has also just been approved at the regional level. However, Genoa shows significant levels of criticality compared to other Italian urban contexts: in fact, 25 serious episodes have already been recorded since 2010, including floods that devastated parts of the city and disrupted rail and road infrastructure. The city of Genoa, in fact, is developed in a narrow territory, defined by an arc-shaped conformation, wedged between the mountains and the sea and crossed by two valleys perpendicular to the sea (Polcevera and Bisagno valleys). These two important hydrographic cuts, to which several tributaries are attached, join the coastline drawing that famous inverted Greek P with which Gabrielli (1992) masterfully summarized the unique morphological structure of this city. However, the close proximity of sea and mountains is also the cause of strong thermal instability that causes a high risk of extreme weather events on the terrritory.
Tracing the peculiar morphological characters of the territory through a temporal key, it clearly emerges how this conformation is also the product of progressive modifications and substantial adaptations of the natural environment, introduced by man over centuries of colonization: the Ligurian territory, in fact, and in particular the mountainous hinterland, has over the centuries been stripped, intensively terraced and cultivated, even in inaccessible and dangerous places, making profound and successive modifications even with respect to the degree of biological complexity of the different areas. At the same time, in the years of the economic boom Genoa went through intense industrial development, characterized by heavy building speculation. The resulting anthropogenic sealing, particularly of some parts of the city, combined with the abandonment of cultivation that has occurred in recent decades, has amplified its environmental fragilities, fueling their unbalanced distribution and an urban disorder that, over time, has led to a parallel hydrogeological disorder of the territory (Vergano, 2020).
This precarious situation manifests itself in all its violence during major rainfalls, when the water flows downstream at impressive speeds and with great force along the asphalt surfaces, finding an outlet only when it reaches the streams that run through the city (often completely buried and overgrown by roads and buildings) or in areas where it manages to infiltrate the ground, undermining the stability of walls and slopes. The dangerous landslides recorded in recent years along the Polcevera Valley are a direct result of the dynamics described above.

4.2 The Social Dimension: ecological transaction as new tool of discrimination?

In this fragmented urban context, a second dimension of environmental inequality emerges, that Pellizzoni and Osti (2008) identify as the *social dimension*, for which, despite the fact that the environmental crisis affects everyone, opportunities to protect oneself from climate risks remain a right "across the board", reserved only for those who can afford it.
In this regard, Genoa is defined by Bobbio (2012) as a *"city at risk"* on which several threats weigh heavily, often juxtaposing, feeding off each other, going through critical issues not only environmental but also social and economic (demographic contraction, aging, economic crisis, employment).
Since the mid-1970s, in fact, Genoa has been going through a crisis related to global and local economic-productive changes - which mainly affect industrial port cities - intertwined with a cultural and identity crisis that does not manifest itself uniformly throughout the city.
In particular, as also noted by Petrillo (2020), in the former working-class neighborhoods of the Genoese west and Valpolcevera, permeated by the ideology of work and collective emancipation, in some cases deindustrialization has triggered profound upheavals in socialization processes, on the one hand, undermining forms of shared participation in neighborhood life and, on the other, triggering generational rifts within individual families and processes of desolidarization among individual households.
This was followed, in the early 2000s, by the Genoese phase of major events that, despite their unquestionable significant effects on the urban level, focused mainly on certain areas and sectors of the city's development, relegating the most marginal situations to a state of neglect. It is in this historical phase that, according to some scholars (Piccardo, 2020), that process of separation between community and politics takes shape, the latter being incapable of inventing new languages in which citizens can feel a sense of belonging to an idea of a multicultural, welcoming society that respects the rights of all, open to the new challenges imposed by technological progress and climate change.
With respect to the social dimension of the climate crisis, moreover, the three types of inequality proposed by Therborn can also be found in the Genoese case: 1.) Existential inequality; 2.) Inequality in access to and distribution of resources; 3.) Inequality in life expectancy.
Regarding Therborn's first point, related to the existential dimension of inequality, it is possible to grasp its nature in different situations, starting with certain categories of inhabitants who live in areas characterized by poor levels of accessibility and often not served by public transportation, for whom rising energy costs turn into a form of spatial segregation and forced marginalization with respect, not only to a physical dimension, but also to a social and labor dimension. This is the case, for example, of certain categories of inhabitants of Genoa's working-class neighborhoods, built on hillsides as a result of ex-Law 167/62.
Another reality, linked to the existential dimension of the inequalities caused by the environmental crisis, concerns cases in which inhabitants are deprived not only of a material patrimony, linked to the possibilities of access to and distribution of certain resources, rather than to the possibility or otherwise of enjoying certain opportunities, but also of a precious intangible, identity and cultural patrimony, a patrimony linked to the long history of a community, which can hardly be replaced or recovered. A heritage thus linked to that *Sense of Being* that Allardt (1993) identified as a sense of belonging to a community, defined by identities, collective memories and specific, unique and irreplaceable characters. In the case of Genoa, this loss emerges in all its tragedy for the inhabitants of *Via Porro*, under the Val Polcevera Viaduct, the so-called "Morandi Bridge" and who, as a result of the collapse, were displaced from their homes, initially for a theoretically limited period of time and, later, forever. As also argued by Guano (2021), in such cases, the pain is not only that related to the loss of a material asset, but also that of a shattered domesticity. One's home is more than just a physical space and being deprived of it suddenly dismays, leading to the feeling that the material memory of one's life is falling apart. The story

of the displaced people from Porro Street, now known as "*those of the bridge*", is the story of all displaced people around the world who, due to catastrophic, devastating and traumatic events, have been forced to suddenly - and forever - abandon their homes. In the cases of those who survive and can rebuild a new page of their existence, nothing can ever erase the trauma of the loss they have suffered.

> "Those who believe that material compensation is enough to heal every wound, even the one caused by the loss of one's home, are wrong. The place where we live is not simply a piece of real estate or a physical container, easily replaced. On the contrary, the home is the intimate shell in which we project our inner world: a microcosm of memories and habits that envelop our lives intertwined with those of loved ones". (Guano, 2021: 124).

To the second type of inequality, which Therborn refers to economic possibilities, can be traced many of the recent environmental policies aimed at ecological transition and mitigation, as well as the many economic instruments promoted to encourage new environmentally sustainable habits and actions that, while on a general level will result in benefits and greater well-being, for many people will translate into higher prices for food, energy and other resources: tax deductions for energy upgrades are an example of a policy that favors homeowning households, which, as of today, account for 70.8% of all Italian households (Censis, 2022); as are incentives for electric cars along the same lines.
If the costs and benefits of such policies are therefore not equally distributed among everyone, there will be very different implications and spillovers on households, with an increase in inequalities from both economic and social perspectives, starting from different conditions, such as age, income level, area of residence, as well as employment.
This is the case with carbon-taxes and taxes on other energy from polluting sources, which, by leading to higher energy prices, risk generating decidedly negative distributional results on already economically fragile households: the burden of energy bills, in fact, disproportionately affects the already very low incomes of many city dwellers.
Abnormal heat, moreover, is now one of the most immediate and obvious signs of ongoing climate change, and Genoa, from a study conducted by a U.S. NGO on the Climate Shift Index in 2022 (Csi-Global), was ranked the 9th most affected European city, while Liguria was found to be the region with the highest rainfall intensity in Western Europe. This record of Genoa, however, is also accompanied by another record, related to the mortality rate caused by heat: the heat wave that swept across the country in July 2022, in fact, placed Genoa as the sixth city in the ranking of cities with the highest excess mortality rate, amounting to +49% (Nanni and Minutolo, 2022). These phenomena do not affect the Genoese population indiscriminately, rather piling on some of its inhabitants, characterized by the most severe situations of fragility at the socio-economic level, forced to give up heating during the winter and the air conditioner during the hot summers due to energy price increases, not counting of course homeless people.
With respect to *inequality in life expectancy*, the situation related to the many identities of Genoa emerged in all its gravity during a recent scientific environmental epidemiological study.
The research was carried out on the analysis of extreme inequalities in mortality between different districts of the city, analyzed over a time range from 2009 to 2020 (Contiero *et al*., 2021). The difference between observed deaths and expected deaths was calculated through the Age Standardized Mortality Ratio (SMR), ranging from 124.4% in some districts of "Genova Ponente", that is the western area of the city, historically characterized by working-class neighborhoods such as that of Cornigliano, to 82% for the areas of the eastern Genoese side (Genova Levante), historically inhabited by the wealthy bourgeois class, such as the neighborhood of Albaro. This means that in Cornigliano the observed excess mortality is 24% (increasing to 33% for females), so on average from 24 to 33 more people die each year than the expected 100, calculated based on the city average. In contrast, in Albaro there is 18% less mortality than the city average. If you

live in Cornigliano, therefore, you live less than in the rest of the city, net of the age factor, especially if the comparison is with the eastern neighborhoods.
The results that have emerged from this research are particularly relevant in scope for multiple reasons: first, because these studies bring to light serious inequalities in the access to health care by specific groups of the Genoese population. Furthermore, such studies unequivocally highlight a reality rooted for decades linked to extreme conditions of spatial inequality and injustice, which translates into environmental injustice and which, among the neighborhoods of Genoa, acquires a significant magnitude, defining a deep rift between different parts of the city.
The numbers of deaths, moreover, remain substantially stable for each area, demonstrating the fact that the disparity that exists between Genoa's neighborhoods is not a contingent or passing situation but, rather, a now structural character of the city, which persists, is long-term and worsens as climate change intensifies. Such a situation reveals a condition of impoverishment that now affects a substantial part of the population, regarding both material aspects (such as income, real estate, etc.), as well as intangible aspects (such as access to certain types of networks, services, information, etc.).
Differences in mortality rates among different city neighborhoods may thus be related to multiple urban phenomena, which now become crucial to investigate to initiate more equitable policy strategies that have as their main objectives those of addressing social inequalities and environmental justice.

4.3 The Spatial Dimension: risk hotspots as effects of overlapping social and spatial injustices

The above shows how vulnerability to climate change impacts can vary greatly, not only between countries and global macro-regions, but also within the same countries and cities, introducing the spatial dimension of environmental inequality (Pellizzoni & Osti, 2008): Genoa demonstrates that the impact of climate change manifests itself in different ways and with different intensities in different parts of the city, varying with respect to the characteristics of different resident populations, as well as with respect to their distribution over the territory. Some scholars even argue that the differences between the various italian areas and regions are less evident than those observed between the multiple districts existing in Genoa (Alfonso & Borzani 2018). In such a context, the concept of *spatial capital* (Secchi, 2013; Galdini, 2021) becomes therefore a central key to reading to interpreting the construction of new inequalities, referring directly to the possibilities or not of everyone to know, manage and interact with the reference space, as well as to move freely in it, in order to draw from this the maximum social benefits.
In certain areas, the overlap between the concentration of fragile populations and environmental fragility factors such as, for example, poor-quality or substandard settlements, the presence of large infrastructure or polluting industrial areas in close contact with the residential fabric and the presence of watersheds at risk of overflowing, leads to a mutual amplification of the two fragility factors - the social and environmental ones - that exponentially increases the vulnerability of the population exposed to the multiple possible effects of climate change, generating real "*risk hotspots*" (Carraro, 2022).
The Valpolcevera is a particularly sensitive area of the city, concentrating dangerous risk hotspots with respect to cogent environmental and social conflicts: a brutally exploited and intensely built-up valley, a "gigantic infrastructural tangle" where the massive urbanization of the territory has brought industrial activities close to historically working-class towns, incorporating remnants of urban histories, now marginal. Massive infrastructures were built along the valley, large steel, petrochemical, refractory, and shipbuilding companies were established, many of which were later dismantled, leaving disused plants and environmental conflicts that dramatically elevated health hazards for inhabitants.
The Val Polcevera Viaduct (also known as "Morandi Bridge") was built in the 1960s, towering over

an entire neighborhood historically inhabited by railroad workers, grazing the roofs of its houses and the heads of its inhabitants, without asking anyone's opinion. This could hardly have happened in other neighborhoods, differently characterized at a socio-economic level: if this bridge had had to dominate the heads of the Genoese Levant's bourgeois buildings, different political choices would probably have been made at the level of designed spaces and policies.
Furthermore, such viaduct which, until 2018, remained the only fast link in the east-west axis bearing both light and heavy traffic, was not meant for the load it faced as the first Italian port, with thousands of vehicles passing over the bridge daily, weighing on the territory, polluting it, congesting it, and putting it under pressure. The so-called "Morandi Bridge" also collapsed because it bore this burden for many years in the interest of the country (Acquarone, 2020). Its collapse also suddenly brought to the forefront the serious environmental problems spread throughout the valley and all the geographical and systemic limitations of an entire city.
Immediately adjacent to the bridge, the previously mentioned Cornigliano district represents one of the most exposed neighborhoods in the city with respect to pollution risk, condensing issues related to industrial pollution - mainly due to the hot steel production of ILVA, closed in 2005 but characterized by numerous problems still open - and infrastructural, given by the presence of the Canepa Promenade, a road artery created in the 1970s close to residential buildings covering the entire coastline and further enhanced in recent years; again, mitigation projects are under discussion but we cannot yet speak of satisfactory solutions for the inhabitants involved.
From a cross-analysis with respect to socioeconomic and environmental indicators, in addition to the record for standardized mortality rate (Section 4.3), Cornigliano also takes the top spot on the poverty ranking in Genoa, registering an average Irpef taxable income of the inhabitants of 17.035 euros, the lowest within the city boundaries (MEF, 2019), compared to more than 40.000 euros recorded in Albaro (Municipio Medio Levante).
Outside of Valpolcevera, the lowest levels of average taxable income correspond to some areas of the Marassi neighborhood (equal to about18.000 euros): this is precisely where the Fereggiano, a tributary of the Bisagno River, passes, known for the serious floodings that has occurred in recent years (2009, 2011, 2014) being among the areas of highest hydrogeological risk in the city. Along the Fereggiano, every exceptional flood fails to be contained and drags everything downstream, producing death and destruction because much of the bed is congested and invaded by construction and road infrastructure.
Cornigliano and Marassi represent just two of the possible countless local-scale cases that demonstrate correspondence with the findings of an analysis conducted by the European Environment Agency (EEA, 2019) on the relationship between income levels and environmental inequalities, which showed that pollution is undemocratic and that the health of the most vulnerable citizens is unevenly compromised: for those in the lowest socioeconomic brackets, or most vulnerable by age (children and the elderly), in fact, the chances of living in areas with high levels of pollution, both air and noise, or suffering the worst effects during extreme temperatures and weather events, increase.

5. Conclusions. Environmental justice and care as weapons for the ecological challenge

In an era characterized by incessant transformations, conflicts, contradictions, today most cities, including Genoa, are working on developing strategies aimed at their own reconversion as "Smart Cities", offering innovative policies and tools to improve their competitiveness and the quality of life of their inhabitants. Such a vision requires the development of integrated planning that focuses on the goals of the UN 2030 Agenda, in order to decrease their impact on the environment by increasing, at the same time, the quality of life for all their citizens.
The study found that global inequalities are one of the biggest obstacles to sustainable devel-

opment. For this reason, addressing inequalities will have to become the main focus of climate action and environmental policies, turning a seemingly irreconcilable trade-off (environmental protection and poverty reduction) into a virtuous synergy.
However, climate change is a massive but still largely underestimated emergency that, as this research shows, does not affect everyone equally. Indeed, there is often a tendency to view natural disasters as impartial, random. However, the empirical evidence shows that the categories most exposed to risk are always those characterized by different situations of fragility at the social or economic level, starting with a structural dimension of poverty. There is, in fact, a selective affinity between social inequality and the probability of falling victim to some catastrophe. As Bauman argues (2013), between occupying the lowest rung on the ladder of inequality and finding oneself a "collateral victim" of a natural disaster there is the same relationship that exists between the opposite poles of magnets, which tend to gravitate toward each other.
Similarly, it was seen how even ecological transition policies aimed at creating a neutral climate scenario, if not adequately governed by addressing the profound economic and social impact that such changes could cause in the most fragile population groups, risk turning into climate exclusion, increasing injustices and inequalities.
In such a scenario, every geography presents a rooted degree of discrimination, spatial segregation and redistributive injustice in it, which is why the choice of certain areas for sustainable urban regeneration, based on the creation of a *new urban welfare* (Galdini, 2021) becomes a crucial decision in order to guarantee environmental and social justice, by promoting spatial justice both as a reference value of public policies and as a variable in the analysis of phenomena at the local level. Such issue, thus, also opens up new perspectives of reflection, on the close link between the climate emergency, which should no longer be approached as a "crisis" but as a definitive "turning point", and the political procrastination that characterises the governments of the most polluting rich countries - in particular because the politicians' responses are often budgetary, technocratic or security-related, which aim to confine debates to reductive limits.
Moreover, beyond the numerous concrete actions that it would be necessary to undertake to face the double challenge linked - on the one hand - to the mitigation of climate change and - on the other – to the fight against inequalities, it would also be necessary to rethink the profound meaning of such concepts involved, such as that of *catastrophe* and *inequality*.
In this regard, Bauman (2013) recalls the example of an electrical system by observing that, when it becomes overloaded, the first component to blow is the fuse, of which it represents the least resistant segment. A bridge does not break when the load it supports exceeds the average strength of its spans, but much earlier, at the very moment in which this load exceeds the carrying capacity of the weakest span. Terms such as "average capacity", "average strength", therefore, are only statistical conventions, but it is the weakest element that determines the fate of the entire bridge. Similarly, in structures such as the environmental or social ones, more than the average values (average income, *etc.*) it is the differences between the extreme values that should become the first elements of attention. Thus, catastrophes and inequalities represent both outcomes of a total lack of care for the respective reference structure, where there are numerous "fuses" that blow, in total disregard and indifference.
Inequality, in fact, is too often seen as a threat to public order, treated on a par with delinquency and crime. The concept of inequality, however, goes far beyond this limited vision, implying a structural dimension of contrast with respect to the collective well-being of society, to the quality of life of the entire population, as well as to the degree of participation and the solidity of the relationships that unify the communities. Inequality legitimizes the unfair contract between haves and have-nots, transforming contingent facts into ascriptive bases on which to assign the belonging to a social class (Rawls, 1971) and destroying the social ties that unite men.
With respect to the issue of climate catastrophe, too often we are witnessing a process of deresponsibility in front of such events, bringing them back to unpredictable natural causes. Instead, we should start from the concept of *anthropization* of the catastrophe (Tagliapietra, 2022)

for which the destructive effects have purely anthropic origins, directly linked to the increasingly rapid and intense processes of urbanization. If the causes of climatic disasters are always human, therefore, every catastrophe could be avoided and man - and not accidental events - becomes solely responsible for the decline of his own species (Pellizzoni & Osti, 2008).
Speaking of man's responsibilities with respect to climate change, Pellizzoni identifies the Anthropocene as the home that men share with non-humans, tracing a fundamental passage from non-modern peoples, who had interfaced with their own biophysical *milieu* by taking care of it and changing together with it, with modern peoples who, instead, have claimed to get out of it, building a house just for themselves. Ecological threats are therefore a call to return to a previous dimension, reducing human agency, making it less arrogant and more responsible, redefining its relationships in a perspective of equality, respect, and care, rather than domination and conflict (Pellizzoni, 2022) and finally turning towards a necessary perspective of "environmental justice".
In a similar way, considering the socio-spatial effects of the articulation between predation of contemporary capitalism and destruction of natural resources, Xavier Ricard-Lanata (2021) calls for "an indispensable insurrection of consciences" and, with respect to this need to take a step back, several scholars are also speaking now of a necessary process of *deglobalization*, which would already be underway with respect to multiple dimensions (Goldberg & Reed, 2023).
Finally, considering the concept of *care*, which acquires a fundamental role in the perspective of a future paradigm shift, Olivetti's words are still extremely topical, with which he summarized the experience of the first *communities,* guided by faith in the human possibilities and in the dialogue between technology and culture, understood as a collective knowledge and heritage, a fundamental, solid and profound bond between people. In these reflections, Olivetti talks about the dignity of people, common good and care, corporate responsibility towards workers and the environment, where science, technology and the economy are tools at the service of the community:

> Western civilization finds itself today in the midst of a long and deep labor, at its definitive choice, since the material forces that science and modern technology have placed at man's disposal can be handed over to our children (...) only in a substantially new order, subjected to authentic spiritual forces (...): Love, Truth, Justice, Beauty. The men, the ideologies, the States that will forget only one of these creative forces will not be able to show anyone the path of civilization. If material forces withdraw from spiritual impulses, if the economy, technology and machines prevail over man in their inexorable mechanical logic, the economy, technology and machines will only serve to concoct destruction devices (Olivetti, 1959: 45).

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Veronica Conte, Guido Anselmi[1]

The Contradictions of Platform Urbanism: the Role of Corporate Property Managers in the Vacation Rental Market of Milan[2]

Introduction

Over the past decades, cities have received massive investments, in the form of venture capital, from technology companies investing in the digitalization of urban governance, on the one hand, and the platformization of service provision on the other. This process, referred to as the "urbanization of technological capital" (Sadowski, 2020), has developed over time, from the rise of the smart city paradigm to the urbanization of "platform capitalism" (Srnicek, 2016) and the affirmation of sharing economy agendas. While the former has been steered by a range of large companies providing new services to city governments, the latter has been driven by a variety of digital platforms providing services to consumers (e.g. food, mobility, housing).

Today, we see that both phenomena have significant implications for the city and, in particular, for real estate dynamics. Scholars point out that, under the rhetoric of smart and sharing city development, "the pace and scope of digital innovations aimed at the real estate industry have intensified" (Fields & Rogers, 2021, p. 72), leading to what Shaw (2018) calls the new real estate/finance/technology complex. The latter has significantly impacted cities, particularly in terms of access to basic services and to housing. Thus, despite initial claims that digital platforms are fair, sustainable and equitable, scholars are moving beyond what Grabher and König (2020) call the "sharing euphoria" to understand the extent to which platforms have opened up new avenues for the circulation and accumulation of capital.

In this paper, we intend to contribute to the scholarly discussion on the contradictions of platform urbanism and, in particular, on the "paradoxical tension" (Andersson Schwarz, 2017, p. 5) that characterizes digital platforms as: (i) "generative and democratic innovations" (*ibidem*) and (ii) mechanisms for capital accumulation. To achieve our overall objective, we zoom in on the vacation rental market, the growth of which has been identified as one of the key drivers of the housing affordability crisis, on the one hand, and gentrification and housing financialization on the other hand. Most of the literature on the topic has served as a foundation for developing a critical account of Airbnb as a sharing platform. Airbnb, which today has more than 5.6 million listings in over 100,000 cities, has been described as a key player in the real estate industry, enabling the transformation of vacation rentals into an asset class for individual and corporate investors. We argue that previous studies, while crucial, fall short in understanding other important players that professionally manage tourism properties using digital technologies and platforms, and for all of these reasons we shift the focus to professional corporate property managers (CPMs).

We conduct our study on Milan, a secondary node in the network of real estate capital that is rapidly globalizing, also leveraging local tourism. Through data collected on Inside Airbnb from 2016 to 2021, we calculate concentration measures to estimate CPMs earnings and identify the most important players in the market. In order to obtain insights on the leading CPMs, we utilize Aida, a database that masters and collects detailed biographical and financial information on companies active in Italy. Finally, we offer a taxonomy of the top CPMs in the city. Our ultimate goal is to bring additional elements to the discussion on market regulation in contexts char-

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acterized by competitive growth agendas, the growing power of technological and financial actors, and the need to adopt more sustainable and equitable housing policies
In section two, "Digital platforms and the contradictions of platform urbanism", we introduce the literature on platform urbanism and real estate and review evidence on Airbnb and CPMs. In section three, we present the methodology of our work. In section four we introduce the case study: the city of Milan in Italy. In section five, "Patterns of concentration: towards a taxonomy of corporate property managers in Milan", we present the analysis and profile the main corporate actors in the vacation rental market. Finally, we draw some preliminary conclusions from our analysis, discuss the limitations of our work, and open new avenues for future research.

1. Digital platforms and the contradictions of platform urbanism

The development of cities has historically been driven by the provision of infrastructure, such as ports, highways, aqueducts and railways, which shape the built environment (Graham & Marvin 2002) and «the physical landscape utilized for production, exchange and consumption» (Harvey, 2006, p. 233). Infrastructures, however, do not only consist of tangible assets. They are important financial assets, the development of which is deeply intertwined with the cycles of capital accumulation (Harvey, 1978). Indeed, not only do they have use value for citizens (Logan & Molotch, 1987), but they also represent an important way for capital to circulate and to absorb periodic crises of accumulation. As such, infrastructures allow "idle" money to find value while giving capital holders control over strategic societal assets.
In recent decades, cities have been the target of massive investment, in the form of venture capital, from technology companies investing in both the digitalization of urban governance and the platformization of service provision. This process has been defined as the "urbanization of technology capital" (Sadowski, 2020). It has evolved over time, from the affirmation of the "smart city" paradigm to the introduction of sharing city agendas. Both owe their success to a number of economic and political factors, namely technological innovation, investment in technology and, most importantly, a general political emphasis on social justice and environmental sustainability (Artioli, 2018). Although they developed sequentially and sometimes even simultaneously, there are some important differences that are worth noting, particularly in terms of the type of services provided and their main target audience.
First, while the goal of the smart city is to design new devices to govern a territory, the goal of the sharing city is to «construct a new techno-economic infrastructure on which city inhabitants will live» (Sadowski, 2020, p. 5). Indeed, in a context characterized by fiscal austerity and growing inequalities in access to consumer services, sharing city agendas have been introduced as an innovative and democratic paradigm to foster Peer2Peer exchanges and access-based consumption of goods and underutilized resources (Baum, 2017, p. 41). Secondly, while the former has been led by a number of large companies, such as IBM and Cisco, providing city governments with new devices to make cities more efficient and livable (Sadowski, 2020), the latter has been driven by a range of platforms that allow two or more groups to interact (Srnicek, 2016) and to deliver a variety of services, such as food, mobility, and housing.
With this in mind, we understand digital platforms as strategic infrastructures of contemporary cities (Kitchin, 2014; Graham & Marvin, 2002) and drivers of the so-called urbanization of "platform capitalism" (Srnicek, 2016). Like physical infrastructures (e.g. ports and railways), they depend on complex financial engineering (*ibidem*). They open up additional venues for the circulation of capital (Fields & Rogers, 2021), channeling capital either into the expansion of platforms or into real estate (*ibidem*). Unlike physical infrastructures, they also enable the extraction of rent through the control of data which, in turn, allows them to anticipate and generate specific consumption trends (Zuboff, 2019; Arvidsson, 2016). They can create monopolies (Anselmi

et al., 2021) either because they have total control over data and technologies (Zuboff, 2019), or because they are at the intersection of tech, imaginary, and finance (Arvidsson, 2016). But, most importantly for our work, digital platforms, especially those operating within the sharing economy, represent yet another «mode of accumulation [...] grounded in a broad and semantically hyper positive discourse around collaboration» (Arcidiacono *et al.*, 2018, p. 276).

Despite initial claims that digital platforms are fair, sustainable, and equitable, scholars are moving beyond what Grabher and König call the "sharing euphoria" (2020) in order to understand the extent to which platforms have created a new marketplace based on «the compulsive logic for ever-increasing profit under the sign of neoliberalism» (Pais & Provasi, 2020, p. 218; see also Cansoy & Schor, 2023). They emphasize that today digital platforms are «reconfiguring the terrain of cities» (Fields & Rogers, 2021): not only do they facilitate «the landing of [transnational] capital in real estate» (*ibidem*, p. 73), but they also significantly affect inequalities and access to basic services. Indeed, under the rhetoric of smart and sharing city development, «the pace and scope of digital innovations targeting the real estate industry has intensified» (*ibidem*, p. 72). In the housing market, for example, PropTech digital firms are revolutionizing the way people search for, buy, sell, rent and manage residential property. Drawing on works in economic geography and platform studies, Shaw (2018) argues that their growth is creating a new real estate/finance/technology complex (*ibidem*). The pandemic and the housing affordability crisis have been important catalysts for change, as in the cases of the UK and Germany where PropTech companies are being used to manage large portfolios and bring new "affordable" residential solutions to the market, such as co-living and shared living arrangements. In the vacation rental market, we not only see large digital platforms, such as Airbnb, gaining an important role in defining the way people search for and rent holiday accommodation, but we also observe a proliferation of other corporate actors managing tourism properties in a professional manner, supported by digital technologies and platforms. Thus, with this paper, we aim to further contribute to the discussion on the "paradoxical tension" (Andersson Schwarz, 2017, p. 5), or contradictions, characterizing digital platforms as: (i) «generative and democratic innovations» (*ibidem*) and (ii) mechanisms for capital accumulation. To fulfill our overall goal, we zoom in on the vacation rental market, the growth of which has been identified as one of the key drivers of the housing affordability crisis (Gurran, 2018), on the one hand, and gentrification and housing financialization on the other hand (Jover & Cocola-Gant, 2022; Tulumello & Allegretti, 2021; Aalbers, 2019; Cocola-Gant & Gago, 2019; Wachsmuth & Weisler, 2018; Cox, 2017).

There is a broad consensus in the literature that, over the past decade, vacation rentals have become «another asset class» (van Loon & Aalbers, 2017, p. 221) for a «highly heterogenous group of actors» (Wijburg *et al.*, forthcoming, p. 2) composed of [local and global] individual and corporate investors who own multiple listings and profit from renting them out for tourism purposes. Scholars argue that by listing their properties on Airbnb, tourism investors find new ways to capitalize on the diverse demands of a wide range of temporary populations (Brollo & Celata, 2022), such as visitors, businesspeople, students, digital nomads, and the like. Investors benefit from the hyper-flexibility (Cocola-Gant & Gago, 2019) and hybridization of the market (Wijburg *et al*., forthcoming; Gil *et al*., 2023; Cocola-Gant *et al.*, 2021b), that is, they can adjust their supply as needed in order to meet new demands. This last trend, analyzed in detail in the case of Lisbon by Cocola-Gant (2020), was observed worldwide during the Covid-19 pandemic when, in order to cope with travel restrictions and the consequent decrease in tourism flows, vacation rentals were converted into (mid and long term) residential rentals (Cocola-Gant, 2020; Thackway & Pettit, 2021; Kadi *et al*., 2020; Romano, 2021) and then gradually put back on the short-term rental market when restrictions were eased (Gil *et al.*, 2023).

Previous research on Airbnb has already challenged the rhetoric describing the platform as a sharing economy practice (Cocola-Gant & Gago, 2019; see also Adamiak, 2018), showing that it has actually led to "an intense process of buy-to-let investment and professionalization" (Cocola-Gant & Gago 2019, p. 1672), with property owners owning multiple listings and renting

out their assets on a permanent – rather than occasional – basis (Cocola-Gant, 2016; Schäfer & Braun, 2016). Our analysis attempts to go beyond the analysis of Airbnb. We contend that while past analyses have been fundamental in developing a critique of Airbnb as a sharing platform, they fall short in explaining how concretely the accumulation of capital occurs in the tourism property market.

Inspired by the work of Cocola-Gant and colleagues (2021a) we therefore shift the focus *to Corporate Property Managers* (CPMs), which must be considered crucial for assessing the evolution of the vacation rental market. Like any other PropTech company in the residential rental market, CPMs owe their success to the automation of management tasks through digital technologies and platforms which allows them to control and concentrate large parts of the market, both in terms of listings and revenues, at the expense of non-professional hosts (Bosma, 2022; Bosma & van Doorn, 2022). In order to reach a wider consumer base and ensure high occupancy rates, they place their listings not only on Airbnb but also on other channels (Giannoni *et al*., 2021). For all of these reasons, we argue that such a focus can shed further light on the contradictions of platform urbanism, and thus contribute to the discussion on market regulation in contexts characterized by competitive growth agendas (Cox, 1993), the growing power of technological and financial actors (Anselmi *et al*., 2021), and the need to adopt more sustainable and equitable housing policies.

2. Research goals and methods

In order to assess whether digital platforms function as democratic and sustainable innovations or are simply another channel for capital accumulation, we present our preliminary findings from a broader project that seeks to contribute to the discussion on the regulation of tourism property investment in contexts characterized by competitive growth agendas and an increasing political and economic power of technological and financial actors. In order to achieve our goal, we focused on CPMs arguing that they are key actors to explain capital accumulation in the city through tourism investment.

From a methodological perspective, we applied a mixed-methods strategy that combines case-study, document and policy analysis, in-depth qualitative analysis of digital data, and computational analysis (Edelmann *et al*., 2020). Our study examines Milan, a secondary node in the network of real estate capital that is rapidly globalizing, also leveraging investments in real estate and local tourism. We chose to use Airbnb data because it represents the primary channel for both individual hosts and CPMs to list properties and reach global consumers (Cocola-Gant *et al*., 2021a), although we recognize that the landscape of channels used to list properties in the vacation rental market is highly diverse and includes a growing number of operators (e.g. Vrbo, Expedia, etc.). We relied on Inside Airbnb, a project that scrapes and aggregates publicly available information on Airbnb with the goal of providing open access information to study the impact of vacation rentals on cities and urban societies worldwide.

It should be noted that there is no 1:1 correspondence between host accounts and companies on Inside Airbnb. It is assumed that sometimes companies choose to open accounts as individual hosts, such as "Mario" or "Alice", which are either completely fake or belong to employees of the company itself. Therefore, we had to perform a thorough analysis of each host account, ranging from analyzing the host's biography to searching for the same person on multiple social networks and/or company websites.

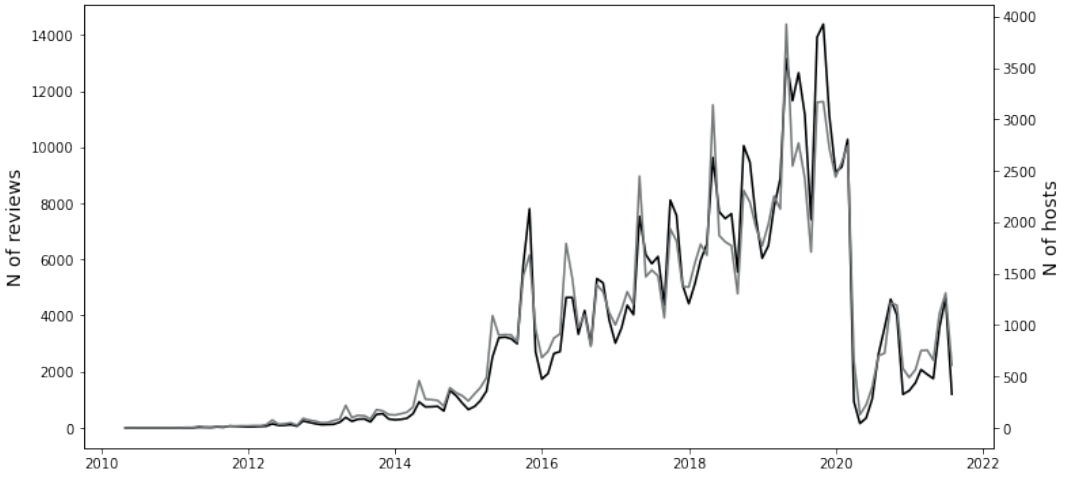
We collected all available review data for Milan, for a total of 434,613 reviews covering the period from 2016 to 2021. We then computed concentration measures to estimate actors' revenues and identify the leading CPMs in the city. In order to gain insights into CPMs operating in Milan, we used secondary data from Aida, a database that tracks and produces detailed biographical

and financial information on companies operating in Italy. Finally, we offered a typology of the most important PCMs in Milan. Our ultimate goal is to provide further elements to the discussion on market regulation in contexts characterized by competitive growth agendas (Cox, 1993), the growing power of technological and financial actors (Anselmi *et al*., 2021), and the need to adopt more sustainable and equitable housing policies.

3. Milan

Milan has a diversified economic structure relying on competitive sectors such as fashion, finance, real estate, design, business services, and research and development (d'Ovidio, 2016; Conte & Anselmi, 2022; Anselmi & Vicari Haddock, 2019; Bigatti, 2016; Gibelli, 2016; Foti, 1993). Following the gradual deindustrialization of the economy in the 1970s and 1980s, local authorities gradually adopted an entrepreneurial agenda and undertook a marketing and branding campaign (Rolando, 2017) to promote the city as a creative, smart, collaborative, and international hub and to support its bid to host the 2015 World Expo. Over the years, the city has gradually consolidated its position as a tourist destination, attracting national and international visitors for a variety of reasons: business, conferences, cultural offerings, trade fairs, sports events, etc. Data show that in the years before the Covid-19 pandemic, between 2017 and 2019, international tourism flows steadily increased by 5% per year (Beltrami Gadola & Lizzeri 2019; Municipality of Milan, 2020), reaching almost 7.5 million in 2019, 9.4% more than in 2017 (Municipality of Milan, 2020).
Against this backdrop, traditional hotel supply has been complemented by a strong growth in vacation rentals through digital platforms (Figure 1). The growth of listings was particularly robust between 2014 and 2019, especially in central areas but with clusters in some non-central districts in the southwest, east and northeast of the city, which are known for hosting fashion and design events (e.g. Tortona, Ticinese, Porta Genova, Lambrate, Città Studi). This positive trend was interrupted only in 2020, when the Covid-19 pandemic hit the Lombardy region. The restrictions on international mobility, which were only lifted in May 2020, led to a dramatic drop in tourist arrivals throughout the country (Della Corte *et al*., 2021), with serious consequences on the hospitality industry.

Figure 1 - Linegraph for users (left axis) and reviews (right axis)] Source. Elaborated on Inside Airbnb data



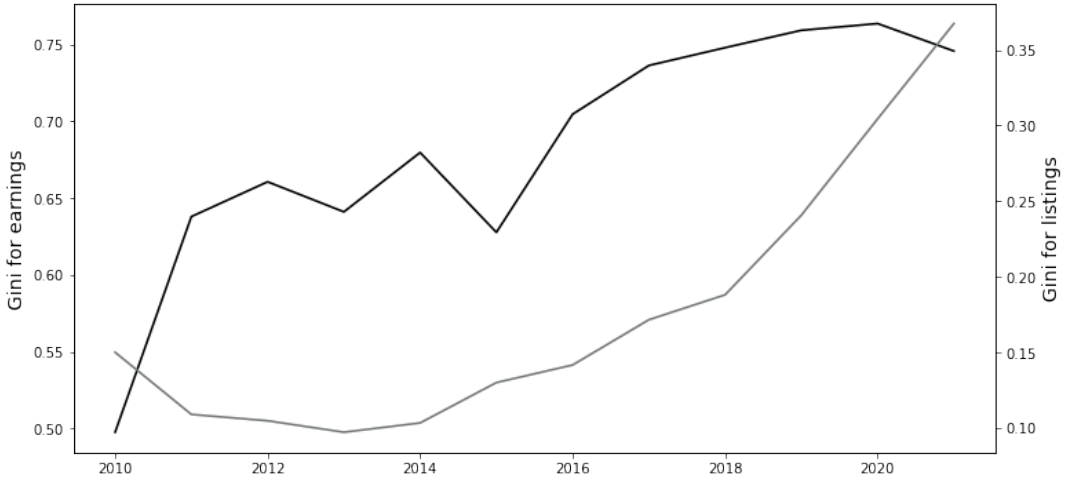
Although the growth of vacation rentals is considered as *one* of the drivers of the housing affordability crisis in Milan, the market has not been subject to any form of strict regulations (Aguilera *et al*., 2019; Anselmi *et al.*, 2021), as in the case of other major European cities like Berlin, Amsterdam, Paris or Barcelona (Hubscher & Kallert, 2022; Aguilera *et al*., 2019). Milan's local authorities

have "opted to tackle the issue through *light* regulatory approaches encouraging the development of the [so-called] sharing economy" (Aguilera *et al*., 2019, p. 1690 – emphasis added). Under the slogan "from property to access" (Pais, 2014), vacation rentals were included in the list of collaborative practices within Sharing City, an agenda adopted in 2014 after a consultation with different stakeholders and experts. The strategy had two overarching objectives: on the one hand, it was seen as a tool to promote social innovation, entrepreneurship, and economic growth; on the other hand, it was seen as a catalyst for social inclusion, sustainable and inclusive economic development (Aguilera *et al*., 2019; Bernardi & Diamantini, 2018).
What makes Milan an even more interesting case for this work is that, over the years, Airbnb has gradually emerged as an important interlocutor of the municipality, as shown by a series of agreements signed between the platform and the City Council, such as the 2014 Memorandum that included new guidelines for the collection of tourist taxes and the supply of rentals during the 2015 World Expo (Mazzucotelli Salice & Pais, 2017), and the 2018 agreement aimed to increase the supply of accommodation at reduced prices in view of the 2026 Winter Olympic Games (Andreis, 2019; Guerrera, 2019). Furthermore, the city has the highest concentration of PropTech companies in Italy. According to the Italian Proptech monitor[3] (2022), there were 152 Proptech companies in Italy in 2020. Milan accounted for 62%. Corporate property managers, that are grouped under the "sharing economy" label, represented the 26% of the total number.

4. Patterns of concentration: towards a taxonomy of corporate property managers in Milan

The large and sudden increase in vacation rental activity raises the question of listings and revenue concentration which in turn is related to the question of whether CPMs function as a mechanism for capital accumulation. In order to measure the concentration of revenues, we assume that each review marks a 3-night stay[4] and calculate the revenue per review, using the Gini coefficient. As we can see in Figure 2, in Milan, both listings and revenues are becoming increasingly concentrated and their concentration is directly proportional to the number of users/reviews on the platform.

Figure 2 - Linegraph for property (left axis) and revenues concentration (right axis). Elaborated on Inside Airbnb data



3 A tool developed by a research group of the Politecnico di Milano to monitor the level of digitalization of real estate and the evolution of the phenomenon in the country.
4 This is an arbitrary value which is consistent with previous empirical investigations (Picascia *et al.*, 2017).

We isolated hosts in the 90th percentile and thus analyzed 119 accounts out of 23,223 active accounts in 2019, controlling 3,141 listings out of 101,064 total listings. The rationale behind this choice is to describe the most powerful hosts on Airbnb, and to build a taxonomy of the most important CPMs in the market. While we already know how concentrated property and revenues are (see Anselmi *et al.*, 2021 or Picascia *et al.*, 2017), we ignore the profile of the players that lead to this concentration. In order to distinguish between individual hosts and corporate managers we used manual content analysis. Because Airbnb's affordances and jargon value on conviviality and interacting with "humans", corporate hosts sometimes disguise themselves as individuals, often through the personal accounts of their employees. To cope with this, we read the top profiles and looked for clues about the status of each account: we investigated the type of account and any reference to a company, either in the profile description or in the hyperlinks and social profiles associated with the same person. After isolating 50 corporate accounts, we consulted Aida to evaluate their profile. We divided the corporate accounts into national (no. 40 in total) and transnational (no. 10 in total). The presence of one of these three conditions was taken into account: 1) transnational capital, i.e. the company is controlled by a foreign (i.e. non-Italian) natural or legal person; 2) geographical scope, i.e. the company has other branches outside Italy; 3) human capital, i.e. at least one of the senior directors or one of the members of the board is non-Italian. Out of a total of 3,141 listings in the 90th percentile, 66% are controlled by corporate entities. The remaining 34% of listings are controlled by individual profiles. Of the 2,074 listings controlled by corporate entities, 26.5% of those controlled by non-domestic actors have higher average revenues (3.3 million EUR versus 1 million EUR) and control more properties (68.6 on average).

We then identified three categories of CPMs that list their properties on Airbnb, based on two criteria: a) market share; b) business model. The first category includes companies that typically manage a dozen or so listings, such as Rebecca's Apartments, which operated manly in the central areas of Milan. The second refers to large chains. They are often active outside of Milan and traditionally manage assets for third parties. One example is CleanBnB. The company was launched as a start-up in Milan, in 2015. In 2017, CleanBnB expanded its activities, first in Rome and Florence, and then in other thirty tourist destinations in Italy. In order to expand its activities abroad, the company was then listed on the stock exchange in 2019. Today it has more than 150 employees and works for more than 2,000 property owners in over seventy cities. The third and final category is made up of large companies that manage a mixed portfolio of listings owned by themselves and other investors. One example is Sweet Inn, a French-Israeli limited liability company founded in 2014. With the slogan "rent an apartment, be treated like a hotel guest", Sweet Inn operates in fifteen European cities and has more than 550 luxury serviced apartments. Despite the differences in market share and business model, all these PropTech companies share some similarities. First, they offer a wide range of professional services. These include bureaucratic assistance, such as collecting and paying tourist taxes. Second, they help landlords set up their properties and monitor the condition of the property after it has been rented out. Third, they are responsible for the management of the house, from listing it on Airbnb and other channels to checking guests in and out. Fourth, they provide cleaning services. Last but not least, they operate as "second-level platforms", i.e. they also list properties on their own website and thus act as direct intermediaries between property owners and customers, with digital facilities that closely mirror those of Airbnb (e.g. room photos, customer-generated 'scores'). Although some of them are not necessarily "born digital", they have evolved over time, in order to become more competitive in a market dominated by digital platforms.

5. Discussion and conclusion

In recent decades, cities have witnessed massive investments by technology companies in smart city and sharing city agendas. Despite initial discourses on digital platforms as innovative tools to promote sustainable and equitable development through sharing practices, it now seems clear that they have rather become instruments for the circulation and accumulation of capital, with significant impacts on the built environment, inequalities, and access to basic services and goods. In the housing market, for example, PropTech companies are revolutionizing the way people search for, buy, sell, rent and manage residential properties, leading some scholars to see the rise of a real estate/finance/technology complex (Shaw, 2018).

In the specific case of the vacation rental market, we see not only large digital platforms, such as Airbnb, gaining an important market position, but we also observe a proliferation of other corporate players professionally managing properties with the support of digital technologies and platforms. In this paper, we unpack the contradictions of platform urbanism by zooming in on the vacation rental market, which has been described as a driver of the housing shortage in many cities and as a catalyst for gentrification and housing financialization. Since most of the literature on this topic has focused on Airbnb and has already challenged the rhetoric depicting it as a collaborative practice, we pursue our objective by targeting corporate property managers that must be considered crucial in assessing how the vacation rental market is evolved and how investors use the vacation rental market to accumulate capital and extract rent from tourist space.

Through our exploratory analysis, we argue that the vacation rental market in Milan is characterized by a very uneven distribution of revenues and a strong concentration of profits in the hands of a small number of players. We observe that, out of a total of 2,074 listings controlled by corporate entities, actors with a transnational profile (26.5%) concentrate most of the profits in the market. This evidence suggests that the market is characterized by power asymmetries between occasional hosts, who occupy a marginal market position, and corporate managers, who control the largest market share. One explanation for this is the crucial role of digital technologies and platforms in the automation of the tasks involved in the management of large portfolios. However, corporate property managers differ from one another. Some control a large share of the market because they have been financially able to expand their activities both in the city and beyond its borders. Others have adopted a hybrid business plan, that is, they not only manage properties for third parties, but also sometimes invest in the acquisition of properties to rent out in the vacation rental market. In order to clarify these differences, we have created a taxonomy that we believe could form the basis of future qualitative work designed to better understand how the tourism property market works.

Our analysis refers to pre-pandemic data, and this is certainly a strong limitation of the paper. However, the research work has resumed from the spring of 2023 with a series of interviews with corporate market players. Preliminary analysis confirms that Covid-19 and the decline in tourism flows did affect the activities of corporate property managers, especially during the first months of the lockdown. Nevertheless, the pandemic provided an opportunity to innovate their business, both in terms of product and process. In fact, some companies have begun to target new consumers, such as businesspeople and students. Others have broadened their scope, for example by adding services to improve the user experience. Others have introduced new technologies, such as augmented reality, to showcase their properties to prospective customers.

This work sheds light on the composition of the vacation rental market in Milan, but has the potential to lay the groundwork for a fundamental critique of development models that, as in the case of Milan, are centered on the sharing economy and digital platforms. Criticism of this model often hinges on large platforms, such as Airbnb, and how they should be regulated. While we recognize the value of this work, we believe that the discussion should also address other actors who play a key role in perpetuating this vision of vacation rentals as an investment asset, and

without whom it would be difficult for investors and owners of multiple listings to rent out their properties in an efficient manner.

Finally, our analysis of Milan calls for future works that examines the role of digital platforms in urban politics. Indeed, platforms derive their political and economic power from discourses and narratives that emphasize their capacity to generate innovation, new economic opportunities for small entrepreneurs, and more sustainable forms of consumption. In our view, a more nuanced approach could not only expose the "power asymmetries inherent within the sharing economy" but also "warn against the control and influence of platforms in defining the rules and regulations" (Dredge & Gyimóthy, 2015, p. 3). Ultimately, it could show that digital platforms are becoming increasingly instrumental for local authorities to use to achieve specific policy goals and growth agendas.

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The promotion of sustainability policy in the urban context: the role of industrial companies[2]

1. Sustainability, urban space and industrial areas

The effects of the connection between urbanisation and industrial development have been the subject of urban studies for more than a century. Today, against the urgency of the changes imposed by the climate crisis, it is necessary to carry out accurate analyses and define appropriate tools that support the necessary alliances that must develop between models of city governments and corporate actions, including their social roles. In addition, it has been widely recognized how civic space is a constitutive element of social, economic, political, cultural, and ecological relations and development processes. In particular, many contributions of geographic urban studies have underlined the significant role these factors take in shaping development itself (Harvey, 1982; Markusen, 1987).

In cities, economic activities are concentrated, innovation develops, transport, trade and information flows converge. Urban and environmental issues produced by rapid urbanisation have become highly problematic for local governments (Dizdaroglu *et al.,* 2012) and many cities in all parts of the world are today struggling with complex environmental or socio-economic problems such as natural disasters, climate change, loss of biodiversity, ecosystem destruction, internal disparities, socio-economic inequalities, and digital and knowledge gaps (UNDESA, 2019).

Historically, in many countries (mainly but not exclusively European), rapid urbanisation has been a direct consequence of the growth of industrial centres (Gollin *et al.,* 2016). More recently, urban areas have been characterised by moments of de-industrialisation (Tregenna, 2009) and re-industrialisation that have led to a series of widespread phenomena, with the emergence of virtuous micro-processes undertaken within the creative-cultural economy and participation in social innovation (Florida, 2005). Above all, however, a new focus has arisen on the promotion of sustainability in the urban environment (Finco & Nijkamp, 2001). Because they host most of the human population and are the places where the majority of the world's energy is consumed (60-80%) and where carbon emissions (75%) are produced, cities are now playing an ever more crucial role in combating the climate crisis and promoting sustainability (UN-Habitat, 2022). The situation fares no better when assessing the impact of industrial activities on world pollution, which is still responsible for a majority of the damage to human health, ecosystems and the climate (European Environment Agency, 2021) we are witnessing in this era.

Reducing negative impacts is therefore a priority that unites cities and industries (Fanfani *et al.,* 2021). This vicinity, both in terms of territory and of issues to be solved urgently, has led to the hypothesis that there is a need to promote 'circular' and 'metabolic' relationships and flows between urban and peri-urban spaces, whether industrial or agricultural (Bellamy Foster, 1999), to sustain settlement resilience (Newman *et al.,* 2009) as well as "non-expulsive" forms of development (Sassen, 2014). From this perspective, we can read about recent efforts to promote development scenarios that have been based on the protection/valorisation of the territory (Cerruti But *et al.,* 2017), through activities such as the reuse of former industrial spaces for socially useful activities or the sustainable and energy-efficient reconversion of production processes and industrial spaces.

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1.1 The promotion of urban and industrial sustainability

From a top-down perspective of the promotion of sustainability, the 2030 Agenda for Sustainable Development comprises the still unresolved benchmark that has been hotly debated in practice and in the literature. These contrasting views have been manifested in the promotion of conflicting policies and "stop-&-go" kinds of actions that different governments have put in place, as well as in the fact that only certain groups in civil society are, today, fully aware of and sensitized to the topic of sustainability. The 2030 Agenda expresses a clear judgement on how unsustainable the dominant development model is, and highlights the needs to integrate economic, social and environmental dimensions in all future actions. All the world's countries are called upon and will have to play an active role in the struggle to contrast the climate crisis. Consequently, each country should actively engage in defining its own development strategy to achieve the Sustainable Development Goals (SDGs) included in the implementation of the 2030 Agenda, which envisages and requires a strong involvement of all components of society, from public sector enterprises to civil society, philanthropic institutions, universities and research centres, as well as information and cultural actors (Mura *et al.,* 2022).
As far as Europe is concerned, in December 2019 the European Commission approved the European Green Deal (COM/2019/640), Europe's sustainable growth strategy, in which the environmental and climate protection goals and the 2050 net zero emission targets were set. Then, the European Parliament defined a series of wide-ranging strategies that aim to support the green transition. Among the points considered in the Green Deal are reducing emissions, supporting the recovery of biodiversity, promoting a more sustainable economic model of production and consumption (through circular economy, technological innovation in industry, recycling, changes in the food system, etc.) and providing economic support for those countries and population groups that are most affected by the changes taking place.
In July 2020, the European Council also endorsed the Next Generation EU (NGEU), providing for the allocation of substantial resources to help EU Member States overcome the Covid-19 pandemic crisis and revive their economies. In order to access the resources provided, Member States had to adopt a Plan for Recovery and Resilience (in Italy the NGEU), which required approval by the European Council upon proposal from the Commission. The NGEU's objective is to stimulate investments that drive recovery and to implement reforms that increase the sustainability of national economies, making them more resilient for the future (Coppotelli, 2022). Unfortunately, recent events in international politics, such as the Russian aggression in Ukraine and the ensuing energy crisis that has mainly affected Europe, but with obvious consequences also worldwide, are rewriting the political agendas of all EU countries and many others also with respect to decarbonisation commitments (Butera, 2022) and sustainability in general.

1.2 SDG for urban and industrial sustainability

Promoting the sustainable development of industries is a key objective of two of the UN Sustainable Development Goals (SDGs): SDG 9 aims to promote inclusive and sustainable industrialisation and SDG 12 seeks to sustainably manage natural resources, chemicals and waste. Furthermore, SDG 11 strives to promote positive linkages between urban, peri-urban and rural areas as well as urban resilience. A recurring concept in these SDGs is resilience. Both the ability of cities to recover after traumatic events and to adapt to changes in the urban ecosystem is what is meant by urban resilience. According to Folke (2016), the most relevant traits of resilience now include the capacity for continued learning, self-organization and adaptation to dynamic environments. To understand the paths of resilience and sustainability in the urban environment we need to focus our attention on the combined impact of urban growth and global climate change, and how

cities can develop whilst, at the same time, the social, economic, environmental, and governance needs of current and future generations can be protected (Wendling *et al.,* 2018). To pursue this aim, clearly, collective efforts and the adoption of interdisciplinary approaches that can address the problem on different levels will be required.

One of the strategies promoted at a European level is the circular economy, that is to say, "a production and consumption model that involves sharing, lending, reusing, repairing, reconditioning and recycling existing materials and products for as long as possible" (European Parliament, 2022a), which is an economic model that pursues a radical innovation of production and consumption systems with the aim of separating resource consumption from value creation. This model adopts the principles of the "3 Rs": Reduce, Reuse and Recycle (Ghisellini *et al.,* 2016):

- the principle of reduction pursues the minimisation of the use of energy, raw materials and waste generation through production efficiency (so-called eco-efficiency);
- the principle of reuse refers to any operation by which products or components that are not waste are reused for the same purpose for which they were conceived (Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and on repealing certain directives, 2008);
- the principle of recycling refers to "any recovery operation by which waste materials are reprocessed into products, materials or substances to be used for their original purpose or for other purposes. Though this includes the reprocessing of organic material, neither energy recovery nor reprocessing to obtain materials to be used as fuels or in backfilling operations are involved" (Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and on repealing certain directives, 2008).

Back in the early 2000s, the application of these principles to industrial development led to the idea of industrial symbiosis (IS), an approach developed primarily in engineering, which "engages traditionally separate entities in a collective approach to competitive advantage involving physical exchange of materials, energy, water, and by-products" (Chertow, 2000, p. 314). More recently, studies focused on developing alternative forms of energy production and consumption have led to the extension of the concept of a mutually beneficial relationship between industry and the urban sphere, hypothesizing the possibility of an urban-industrial symbiosis. This model posits a positive relationship between the urban and industrial fabric. According, for example, to Butturi *et al.* (2019), "synergies among eco-industrial parks and the adjacent urban areas can lead to the development of optimized energy production plants, so that the excess energy is available to cover some of the energy demands of nearby towns". Therefore, for the purposes of this discussion, we have borrowed this idea of positive interaction between the (rapidly evolving) urban space and industrial areas as an example of a very real strategy that can foster regional eco-development in industrialised urban and peri-urban areas.

2. The role of different stakeholders in promoting sustainable actions

The relationship between the urban fabric and industrial systems has been represented using different models since the 1970s, whilst experiences in Italy have provided support to some particularly important contributions (Camagni, 1991; Trigilia 2001). Several models have approached the study of systems innovation from the standpoint of the analysis of the relationships among the different actors involved, such as private companies, public institutions and the research world, (Etzkowitz & Leydesdorff, 1998). More recently, these models (first of all, the triple helix model) has been revisited in order to incorporate the demands of sustainability, adding additional helices to represent relevant categories and advancing the proposal of quadruple helix models. The additional propellers took the form of civil society, the smart city, sustainable green resources or eco-innovation. In recent years, a quintuple helix theory has also included the environment (Galvao *et al.,* 2019, Carayannis & Campbell, 2010).

In contrast to this tendency of adding more helices to the models, Etzkowitz and Zhou (2006) proposed analysing the issue of sustainability through two "twin" triple helices. The traditional triple helix, which exemplifies the cooperative arrangements between university, industry, and government to induce innovation, would then be paired with a triple helix composed of university, government and civil society, which could accommodate the space dedicated to controversies over technological innovation. University, industry, and government relations, based on the principles of reciprocity, most often focus on the positive aspects of developments in science and technology. However, a critical conflict of interests is just as frequently juxtaposed with industry, which pursues maximum commercial performance, and the public actor, which should be committed to upholding high standards for quality of life. It cannot be denied that the university-industry-government triple helix does not necessarily lead to sustainable development (Zhou & Etzkowitz, 2021). When problems arise, public institutions begin to play a distinct role, aimed at remedying the negative consequences of development or technological innovation. This creates a university-civil society-government triple helix, which should pursue a balance between development and sustainability.

2.1 The role of public actors in the sustainability framework

Public institutions can exercise their role of direction and correction of development through a range of complementary strategies, and actions on a level of culture, governance, and economics. The current debate surrounding this role, which is both academic and public, has focused on the different relationships that can exist among these aspects, as exemplified by the Green Deal. These associations can readily combine regulatory reform, recommendations and guidelines, the provision of public resources and services, financial instruments and certifications that are fully capable of attracting private investment in support of publicly allocated capital (Coppotelli, 2022).

If, by shifting our point of view, we focus on the objective of "zero emissions" for example, we can see that public actors have generally undertaken actions, which often complement each other, on all the levels mentioned. All these actions that aim to promote low-carbon behaviour at individual and collective levels represent a push for cultural change. Social advocacy, by public entities (city administrations, educational institutions...), of the concept of carbon neutrality in the population is among the main strategies available for this aim (Choi & Ritchie, 2014). On the governance side, there are actions that promote the reduction of carbon emissions through the formulation of specific policies and the use of economic instruments designed for this purpose. Policy instruments may include, for example, self-imposed limits on the carbon released by a given city or region or the promotion of low-carbon cities, which are particularly widespread in China (Lo, 2014). Economic instruments include both taxation and incentives. The carbon tax is the imposition of a tax on greenhouse gas emissions whilst the carbon credit system includes the allocation of emission allowances to groups of recipients in compliance with national programmes. According to a recent report by the Institute for the Climate Economy (I4CE), carbon revenues reached 49 billion euros in 2020, with 52% of the revenue coming from taxes and 48% from allowance markets. Most of the funds then went into projects related to ecological transitions or the general budget of the jurisdiction where they were collected (Postic & Fetet, 2021), thereby turning these projects into incentives.

2.2 The role of private companies

Since the nineteen-sixties the Corporate Social Responsibility approach has become increasingly popular. CSR promotes the idea that a company should not only be concerned about its profitability and growth, but also about its social and environmental impact, including the needs

and opinions of all its stakeholders in its strategies (Mura *et al.,* 2022). Though Corporate Social Responsibility strategies are usually adopted by companies on a voluntary basis, recent European regulations have shown a trend towards pushing the transformation of what were once voluntary actions into legal obligations. For example, the new Corporate Sustainability Reporting Directive (CSRD), passed in 2022, introduced more detailed transparency obligations on companies' impact on the environment, human rights and social standards. The new obligations apply to all large companies, as well as to listed SMEs, which, however, have more time to adapt to the new rules (European Parlament, 2022b).

In a landscape of increasingly stringent regulations and heightened attention to sustainability issues, the need for companies to pursue at least some forms of sustainable innovation is becoming more and more pressing (Cillo *et al.,* 2019). At the same time, sustainable innovation can prove to be a strong advantage for SMEs because it can lead to their gaining a competitive advantage over competitors by increasing brand reputation, customer loyalty, access to sustainable markets and supply chains, and often to access to national and European funding initiatives (Mura *et al.,* 2022).

Whereas the application of sustainable innovation in business includes all aspects and areas, it is not simply limited to product innovation. The different points on which action can be taken include, for example, production systems, logistics, human resources management and infrastructure. However, production systems generally have slow processing times, which cause inefficiencies and waste that reduce system performance (Alves *et al.,* 2015). In terms of sustainability, the benefits of adopting Lean Production strategies such as creating safer workplaces and improving environmental efficiency by eliminating waste, reducing emissions and increasing energy efficiency are described in the literature (Belhadi *et al.,* 2018). In the field of logistics, the focus is usually on mitigating externalities and reducing space and time through the adoption of eco-efficient activities.

Although the application of green logistics encompasses the traditional objectives of coordination activities, it complements these with a broader, more systemic vision that involves all actors along the supply and distribution chains (Engelage *et al.,* 2016). In human resource management, Green HR, sometimes also referred to as Sustainable Human Resource Management (SHRM), has been discussed since the 1990s (Boudreau & Ramstad, 2005; Renwick *et al.,* 2008). SHRM can be defined as the adoption of human resources management strategies and practices that enable the achievement of financial, social and ecological objectives with an impact inside and outside the organisation and over a long-term time horizon (Ehnert *et al.,* 2016).

The basic idea is that to promote the organisational sustainability of a company (Benn *et al.,* 2014) there is a need for the fusion of innovative organisational theories and the development of appropriate synergistic frameworks to support the improvement of companies' environmental performance (Jabbour & de Sousa Jabbour, 2016). Finally, with regard to infrastructure, over the years, the design of sustainable buildings has become a broad and multidisciplinary research activity (Wang & Adeli, 2014) involving the participation of building owners, contractors, suppliers and users. Most of the research carried out on sustainable buildings has focused on energy saving (the creation of net zero energy or positive energy buildings), water saving and the possibility of making buildings greener by reducing carbon emissions, for example, by installing external insulating surfaces to reduce the energy needed to heat or cool the building (Magrini *et al.,* 2020).

2.3 The interaction between public and private actors

At this specific moment in the history of sustainability, if we observe how private, public and civil society actors interact, when dealing with this issue, we are faced with a number of hybrid forms of sustainability governance (Lemos & Agrawal, 2006). Observing the quality of relationships

between public and private actors in the promotion of sustainability Cashore *et al.* (2021) identified a number of categories, ranging from collaboration to coordination, from isomorphism to competition and "chaotic" coexistence. Often, competitive relations occur when one of the actors, be it public or private, formulates regulations that replace, subvert or empty of meaning those formulated by the other actor. In other cases, the presence of an overly complex system of regulations leads to the coexistence of conflicting objectives whereby chaos ensues.
Then, the question arises: How can these forms of governance reach the ideal situation of complementary collaboration, in which the public supports the private to facilitate compliance and the private sector's objectives so that they are aligned with the environmental policies defined at the public level? Initially, the hybridisation between different forms of governance tends to lead to a proliferation of parallel, and often uncoordinated or even mutually exclusive, standards. This first phase is usually followed by a moment of competition between the different standards, with some of them falling into disuse whilst others conquer their own application niche. After this first selection, coordination mechanisms usually intervene, leading to the integration of different standards, or to the definition of forms of meta-governance. Finally, there is frequently an attempt by public bodies to integrate and expand the implementation of particularly widespread or effective standards, even though they originated in the private sector (Lambin & Thorlakson, 2018). Currently, we are still in a situation that tends toward instability and proliferation, where the reference framework is neither perfectly clear nor particularly integrated. The case study developed here highlights a number of critical features and addresses the need to explore where companies stand in this debate.

3. Italian SMEs between urban development and sustainability

The 2018-2020 ISTAT Report on Innovation in Enterprises notes that the objectives of undertaking actions with a low environmental impact and of reconciling innovation and environmental protection are being increasingly included within company strategies. In the 2018-2020 three-year period, 40.3% of the innovative companies surveyed declared that they had introduced one or more innovations that had positive effects on the environment. Generally speaking, large companies are more attentive to environmental sustainability (56.1% vs 39.1%) than small companies.

3.1 Methodology

In the context of studying sustainability assessments of several Italian companies, we had the opportunity to collect a set of qualitative and quantitative data that we discuss in relation to the theoretical background so far introduced, focusing on the territorial distribution of SMEs with respect to cities and on the degree of innovativeness and sustainable innovation of SMEs. The tools for data collection included:

- a sustainability assessment reporting tool based on the GRI Standard;
- a semi-structured survey directed at company leaders, organized around four main topics: innovation, growth, and change management in the company, assessment of the company's vision, awareness and efforts made for sustainability, assessment of employees' motivation and vision, relations with the territory and public actors;
- an ad hoc questionnaire investigating daily behaviours (with a specific focus on mobility to/from work) and attitude towards sustainability as well as motivation and attitude to change in relation to work. The questionnaire was submitted to all company staff. Data were collected on a voluntary basis using a pen and paper questionnaire, and the response rate was 52%.

3.2 Sample

Our analysis involved three private companies, which employed between 25 and 500 workers, with a total of 10 production plants (company 1: two plants, company 2: two plants, company 3: six plants), located in North and Central Italy, (Table 1).
Although a sample of convenience was adopted, these specific companies were selected based on their dimensions and locations in relation to urban and peri-urban environments, whilst the sample was not developed with the intention of providing any comparisons of the differences based on their geographical positions. All but one of the plants in the analysis were in the vicinity of urban centres, mostly small and medium cities, placed among industrial zones and agricultural land. Moreover, two of the plants were near natural parks, with high levels of biodiversity. Eight of the plants were near logistical infrastructure (motorways, naval ports, railway hubs), whilst two were relatively far from logistics hubs so the company's suppliers' trucks had to travel significant distances on secondary provincial roads.
Ten relevant actors were interviewed for this study, most of whom were over 70 years old. For the most part, they were CEOs, general managers, HR managers, operations and procurement managers, and members of the administrative and governance bodies. Only one of the interviewees was a woman. None of the facilities involved in the study had a sustainability delegate, and all sustainability decisions were somewhat centralized with the CEOs of each firm.
Whilst in companies 1 and 2, corporate policies were implemented equally in all plants, company 3 had a more variegated situation, where different strategies and management methods were applied by the different functional areas, including customer and supplier relations, use of raw materials and water resources, staff training and skill development, as well as some aspects of human resource management. A total of 656 questionnaires were distributed and collected, covering about half of the total employee population surveyed.

3.3 Results and discussion

The production activities at each of the plants observed caused a number of environmental impacts in the area around the plant, which also included, given their territorial proximity, adjacent cities. The impacts identified were direct emission of greenhouse gases and pollutants at two plants of company 3, intensive use of water with effects on the water basin in nine plants out of ten, production of contaminated water classified as waste in four plants, (one at company 1 and three at company 3), five plants had considerable impact on the road infrastructure, (one plant at company 1, one plant at company 2, and three plants at company 3). In seven of the ten plants, including the business with more than 500 workers, the employees travelled to work exclusively by car. Even though in the other three, located in the close proximity to urban areas, many of the workers used public transportation or cycled to work, they represented a minority of the employees compared to those who drove their cars.
Although the annual revenues of the three companies varied (being €90 M for company 1, €130 M for company 2 and €185 M for company 3 respectively) their behaviour regarding local monetary investments on the ground, was fundamentally the same: small donations to charities or sponsorships of local sports teams or, in most cases, none. In all three companies, total such investments did not exceed 0.05 percent of revenues. In contrast, more substantial investments were made to improve the energy performance of the plants, including the use of photovoltaic panels applied to the thermo-technical assessment of the building. On the other hand, whilst there were more than 1,000 direct suppliers that worked with the ten plants, only company 2 applied environmental and social sustainability criteria, in addition to economic criteria, in choosing a certain supplier over another.
Of the themes touched upon during the interview, five were the most relevant to our research.

The first topic investigated concerned each company's use of space, and its development needs and projects. The use of the local space was not problematic only for company 1. Whereas even though company 2 occupied a very large area, it was located far from logistical infrastructure with high volumes of goods entering and leaving the plant. This meant that the small provincial road that runs through the valley was saturated with trucks, effectively creating a not negligible "occupation" of collective space, which was an aspect that was noticeable to management, but for which there were no proposed solutions.
Company 3, on the other hand, had a need to increase the area allocated to its production facilities. Actually, a transaction to purchase adjoining land had just been completed, involving more than 40 owners of even tiny pieces of land adjacent to the plant. Therefore, what was once a green area, measuring more than 10 hectares, even though it was not maintained, was converted into a built-up area with no specific concerns expressed by management. Even if the company was already situated in a highly built-up area, the further cementing or taking away of green space, open land for agriculture was not perceived as problematic.
Secondly, managers were asked to assess how important and/or strategic for their companies it would be to achieve sustainable innovation and in what specific areas the innovation effort was being focused. According to the managers of company 1 and company 2, their organizations needed to invest in sustainable innovation because their customers were large multinational organisations that, over the past few years, have adopted increasingly stricter criteria regarding the environmental impacts of their suppliers' products and processes. Therefore, the pursuit of sustainable innovation was an instrumental interest, focused almost exclusively on the environmental and reporting aspects that are required by customers. In these cases, social sustainability was not addressed, even though management did recognize that being a sustainable company is an important and attractive factor for younger generations. Company 3, having no significant reporting obligations to date about sustainability, was instead very focused on the wellbeing of its workers and the local community. They had been working to activate processes to increase sustainability awareness and skills, whilst also trying to implement innovative paths, some that might even be considered radical.
Another element that was taken into consideration was the level of sustainability awareness, that is to say, the motivation and openness to change found among all employees, which should have had a cascade effect on the local community (social advocacy and cultural change). Management judged its employees to be, on average, moderately motivated in the workplace. This was a point we were able to confirm by comparing the interviews with the results of an anonymous survey administered to all workers. Moreover, the quantitative data collected showed a greater level of openness and motivation to change (in a sustainable direction) among white-collar workers than there was among the blue-collar workers. However, the active roles of the employees in the plants involved in the study was shown to be low or non-existent. Granted that most of the unsustainable behaviours adopted by employees (e.g., exclusive use of the car for workplace mobility) were perceived as problematic, these were not the subject of actions that were deemed to require a change.
There were some formalised processes used to collect ideas and proposals for change and innovation from employees, yet participation was low. Since company 3 was relatively young and had a recent history of takeovers, which created a rather diverse situation both territorially and in terms of organisational culture, the male presence was predominant, sensitivity to issues of diversity and inclusion was very low, and attention to environmental impacts was basically limited to legal compliance. This situation seemed to be only partially acknowledged by management, which, although aware of the problem, seemed to lack the appropriated knowledge to implement concrete solutions.
The next point of this investigation focused on the relationship between private and public, which brought up the questions: Who is responsible for promoting sustainability? What was their opinion on the tools the public provides to impel sustainability? The leadership figures interviewed were

quite critical of the public's role in supporting a sustainable transition. Company 1, which worked in the automotive sector, where there are many regulatory constraints, foresaw even stricter regulations for the future. Albeit, the other two companies have fewer constraints, in the future, they too will be affected by increasingly restrictive regulations on the environmental impact of their processes and products. Within this framework, the role of the public actor was perceived as purely regulatory, since it did not provide any material support for development and change.
Nevertheless, some specific issues did indeed emerge in this regard. For example, it was pointed out that, because there was no local public transportation, no car sharing services, and the location of the plants made it dangerous and objectively uncomfortable to use a bicycle, in most cases the only way to get to work was to use one's personal car. The companies have not proposed any solutions, nor have they encouraged carpooling, or done any mobility tracking of their employees. Management's view is that it is not up to the company to take action to improve public mobility infrastructure, but if there was a roundtable discussion promoted by a public actor to propose improvements, they would gladly participate.
Another example was related to the infrastructure to produce renewable energy. Companies 2 and 3 had just installed photovoltaic panels on the roofs of their plants, and company 1 was planning to do so soon. The reasons for this operation were purely economic, given the rising costs of energy. Indeed, producing clean energy is generally perceived as the task of the energy producers. It would be very positive if a public actor conveyed the production of energy from renewable sources within an area, thus including the roofs of houses and factories, without relying on citizen's sensibility and resources.
Finally, as concerns waste management, company 3 contracted the collection and treatment of its waste to several consortiums in the areas where the different plants were located. The waste produced was all properly classified according to national and European regulations. The regulations, however, stipulate that a company can deliver its waste by classifying it with a code that assigns to the collector the responsibility of sorting it and allocating it for reuse, recycling, composting, waste-to-energy, or landfill. The group, by custom, had always classified its waste for this latter method of disposal. Therefore, even though 98% of its waste was composed of recyclable materials, the company was unable to say with certainty where the waste it delivered would end up nor what the actual percentage of recycled waste was. Again, it appeared to be the public actor that was not capable of playing any role in waste treatment coordination or in ensuring better management of the process, including from a circular perspective.
In the experience of those interviewed, collaboration among actors to promote sustainable innovation were rare, since nearly all actions were implemented based on autonomous inputs. Apparently, the private sector (especially multinational clients) frequently set environmental standards to which the entire supply chain is expected to conform, under penalty of exclusion from doing business. Sometimes, these standards are drawn from supranational legislation, though more often, there are no defined rules and standards can vary from client to client.
Only company 2 had a very strong connection with the local community, and actively promoted economic, environmental and social sustainability. Recently, company 2 promoted projects in collaboration with a nearby women's penitentiary, and with some hospitals which were both local and in other parts of Italy, to further the understanding of and harness the positive social impact generated by its products. However, there were no formal discussion groups or committees in which private and public actors participated, nor were there any monitorable and verifiable processes to manage this system of territorial development. In the other two cases, although the path to include the promotion of sustainability in the local community had only just begun, so far the process was entirely internalized and was supported by private consultants whilst there was no relationship being developed with the public or even among the workers. In all cases, also due to the size of the companies (all of which were SME) their relationship with the territory was mainly the result of the specific representations and sets of values expressed and maintained by management.

Conclusions

The general aim of this study has been to reflect upon the relationships between industrial and urban areas, and the critical role that both must play in the path to a sustainable future. Academic research is already debating the positive impact that a carefully planned interaction between companies and nearby urban areas could have in terms of sustainability. At the same time, the difficulties of promoting coordinated and mutually supportive actions between public and private actors have been highlighted, and we seem to still be in a phase of overlapping and conflicting regulations and attributions of responsibilities.

Since the nineteen seventies many models explaining the processes that interlink industry, innovation and growth of cities have been proposed (Ramella, 2013). More recently, thanks to the growing attention dedicated to the issues of sustainability, climate change and the general problems derived from human activities in the Anthropocene (Beall & Fox, 2009), and different aspects of this relationship have become the focus of attention. As clearly stated by the SDG 11.a, it has today become imperative to "support positive economic, social and environmental links between urban, peri-urban and rural areas by strengthening national and regional development planning", in order to achieve sustainable urban environments. The definition of policies and development plans that may ensure balanced territorial evolution is tightly intertwined with the promotion of sustainable industrialization (SDG 9).

Small and medium size companies represent a relevant proportion of Italian industries, and are usually situated in peri-urban areas, industrial zones or those regions previously dedicated to rural or agricultural activities. As a consequence of this proximity, the unsustainable impact of a company necessarily affects a city in several ways. A number of examples of these relationships are provided by our sample. For example, poor management of the waste generated by industry tends to clog up a city's waste disposal network. Disproportionate use of the road network compared to its structural capacity has often been found to be a detriment to the community (heavy traffic, roadway impairment, etc.). Unsustainable models of production, and management of corporate activity can and often does create an unsustainable organizational culture that affect all its employees.

However, companies can become promoters for the development of a wide range of sustainable practices. They can be involved in the planning and realization of infrastructure networks and home-work journeys, with positive spin-offs for the local community. They can also create the conditions for the emergence of energy communities, as proposed by the UIS models. By fostering staff training on sustainability, which is functional to the company's activities, yet which produces a change in people's mindset and thus in the urban community itself, these goals can be achieved to some extent.

What emerged clearly from our investigation, however, was a generalized lack of tools and knowledge among private actors. This seems to stem from the fact that companies lack standardized procedures and professional figures devoted to the management of sustainability, and, consequently, a number of significant issues arise. Starting from the overrepresentation of older males in decision-making positions, these issues often include the lack of the adoption of any sustainability criteria for the selection of suppliers, the problematic use of the territory, with negative impacts on green areas and infrastructure and, also, little or no reinvestment of corporate revenues to support local sustainability endeavours. For the most part, any actions implemented are not organized through general, comprehensive planning and tend to address very specific issues with a reduced overall impact. Within this confused regulatory scenario, where different systems of legislation and standards coexist and, in some cases, even overlap, communication among the actors is frequently impaired by an insufficiency of channels of interaction among stakeholders, especially local actors (companies, employees, civil society, local administrations, etc.), which often leads to a tendency to offload responsibilities.

This is a scenario that appears to still be prominent. All too often sustainability is conceptualized more to "remain in the game" played among the big international industries than as an asset in and of itself. Especially in Italy there is clearly a lack of a strong and acknowledged public actor capable of sustaining small and medium industries in this change.

Accordingly, many questions remain open for serious discussion. These include the path to translating European and international goals into effective local strategies of development, and then into those very strategies that would support the integration of sustainable planning at all levels of corporate action, and that could ensure real collaboration with local stakeholders. Regardless, it still seems fair to affirm that there remains significant, unexploited potential in relations that can possibly be developed among industrial and urban areas and concerned actors and stakeholders. Further research should broaden the samples selected, allowing a deepening of the understanding of the reciprocal influences that arise between companies and local communities, and the impact of different territorial forms of governance and local actors on the development of sustainable systems.

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	Company 1		Company 2	Company 3				
Annual revenue	about 90 million euros		about 180 million euros	about 160 million euros				
Employees	About 100 employees	About 100 employees	About 600 employees	About 100 employees	About 100 employees	About 100 employees	About 25 employees	About 100 employees
Number of plants	1	1	2	1	1	2	1	1
Location	Industrial area in the municipality, inside the perimeter of the ring road, 3 km from the city centre (population circa 200,000)	Industrial and commercial area of a small town, adjacent to a highway, and to a regional nature park, 10 km from the city centre (population circa 100,000)	Provincial road, in the middle of the countryside, outside industrial and urban areas and far from logistical infrastructure, 11 km from the city centre (population circa 40,000)	Industrial and commercial area of small town, adjacent and to a natural park, 10 km from highway, 12 km from the city centre (population circa. 100,000)	Industrial area, 5 km from highway, 2 km from the city centre (population circa 25,000)	Industrial area, adjacent to Po River, 20 km from the city centre (population circa 100,000)	Industrial and commercial area 10 km from Rome's "Grande Raccordo Anulare" [Ring Road]	Industrial and commercial area in a small town, adjacent to a national park, 9 km from the city centre (population circa 100,000)
Environmental impact of production activities	Metal turning, use of water in industrial processes and production of contaminated water	Metal turning, use of water in industrial processes and production of contaminated water	High amount of logistics activity (all warehousing is in-house), high greenhouse gas emissions from the supply chain located in the surrounding area	Metal turning, use of water in industrial processes and production of contaminated water	Low environmental impact	Metal turning, metal painting, use of water in industrial processes, production of contaminated water	Low environmental impact	Metal turning, metal painting, use of water in industrial processes, production of contaminated water
Home-work commute	Use of personal cars average, also alternative transportation, including public transportation and bicycles	Use of personal cars prevalent, average distance driven over 20 km	Exclusive use of personal cars, average distance driven over 30 km	Exclusive use of personal cars, average distance driven over 30 km	Use of personal cars average, also alternative transportation, including public transportation and bicycles	Use of personal cars prevalent, average distance driven over 25 km	Use of personal cars prevalent, average distance driven over 40 km	Use of personal cars average, also alternative transportation, including public transportation and bicycles
Approximate number of direct suppliers	60	80	315	320	280	380	240	50
Actions to monitor or assess social or environmental sustainability of direct suppliers	None	None	Monitoring protection of workers' rights of suppliers located in the Far East. Selection of 80% of suppliers within 100 km of the plant.	None	None	None	None	None
Investments in local territory	None	Donations and sponsorship of sports teams	Donations, end-of-life of unsold products to local and national entities with social benefit purposes	Donations and sponsorship of sports teams	None	None	None	None

Investment in environmental sustainability initiatives	None	Photovoltaic panels	Photovoltaic panels	None	None	None	None	None
Level of sustainability awareness*	Medium-high for white-collar workers, very low among blue-collar workers		Medium-high	Low				
Level of employee engagement in sustainability initiatives	Circumscribed initiatives in which the individual worker can contribute		Presence of dedicated tools to engage employees, but participation is low	No actions and no space for employees to introduce sustainable innovations				
Initiatives with local government	None		None	None				
Network relationships with other stakeholders	None		Roundtable discussions with local suppliers. Applied research initiatives in collaboration with universities, hospitals and prisons	None				
Circular economy/ Waste management initiatives	Closed loop between foundry and organization for recycling and re-refining aluminium scrap		Use for a line of products of at least 80 percent recycled paper and at least 60 percent recycled plastic from local suppliers	Closed loop between foundry and organization for recycling and re-refining aluminium and other scrap metals				

* The level of sustainability awareness has been defined via cluster analysis on the quantitative data collected via questionnaires

Luca Bottini[1]

The future of smart cities and the role of neighborhoods in influencing sustainable behaviors: A general overview[2]

Introduction

Contemporary cities are entering a phase in which their centrality in mitigating the effects of climate change and reducing anthropogenic greenhouse gases in the atmosphere is crucial. At the beginning of the 19th century, the major cities of the Western world went through a major transformation, from a "pre-industrial" to an "industrial" urban model (Mela, 2018), basing their economies on manufacturing, which resulted in a consequent massive expenditure of fossil-derived energy to sustain the economic development. Since then, anthropogenic activities have been consistently growing due to social and economic development involving the Western world and a good portion of so-called "developing" countries. This exceptional economic growth has gradually released into the atmosphere an impressive amount of carbon dioxide from economic and individual activities that, since 1950 to the present, is reported to have increased sixfold.[3] Cities are the hub of the global carbon cycle, with a high volume of carbon dioxide emissions (Nangini *et al.*, 2019), positioning them as the main form of human settlement responsible for the climate change we are experiencing. Therefore, cities can and should be places where the irresponsible and disrespectful use of natural resources are adapted into new sustainable behaviors. Cities, with their high concentration of ideas, professionalism, intangible resources, and opportunities for social, technological, and economic innovation, represent the perfect place for experimentation with new sustainable lifestyles, subsequently spreading such practices to the rest of the region, territories, and states. The great challenge, then, is the reduction on a global scale of carbon dioxide emissions produced by human activities – a "decarbonization" in which cities are the main protagonists (Linton *et al.*, 2022). Based on these premises, since the early 2000s, the general debate in the study of cities, including such fields as the social sciences, urban planning, computer science, and engineering, has shifted towards the concept of smart cities (Dezi *et al.*, 2018). This concept refers to a series of strategies aimed at improving the quality of urban life through an efficient interaction between the material dimension of the city and society, aiming to achieve goals of social, economic, technological, and environmental sustainability (Caragliu *et al.*, 2009; Dall'O, 2014; Haarstad, 2017). The concept of a smart city can find application when considering a city as the result of a composition of smaller areas and communities. Neighborhoods, in fact, represent the fundamental elements for the construction of a city as a whole. A "smart" approach to urban policies cannot be achieved by considering the city as a single and homogeneous context. The achievement of "smart" objectives must necessarily harmonize with the specifics of each neighborhood, each with its own social, urbanistic, cultural, and identity factors. Decarbonization policies are therefore one of the fundamental challenges of future smart cities, and the achievement of these objectives necessarily involves the interaction between a macro and micro spatial dimension. To better understand this interaction, it is necessary to first choose the perspective or approach one intends to adopt to focus on the problem. The relationship that ties decarbonization to urban societies can be investigated by assuming two levels of analysis: a "macro" level on the one hand and a "micro" level on the other. The macro level includes policy choices and models of urban and territorial governance, such as supporting the reduction of greenhouse gas emissions through regulations, political actions, and social and economic development models aimed at achieving these goals. At the

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3 "Our World in Data, 2021" (https://ourworldindata.org/co2-emissions).

"micro" level, however, the urban community and its citizens are put at the core of the analysis and studied at the neighborhood level. Indeed, literature on smart cities has started to focus on the role of neighborhoods in making cities more sustainable, confirming the idea that dividing a city into smaller communities can act as a catalyst to build a macroscopic effect that steers the city towards a "smart" ideal. In this sense, references to the concept of a "smart neighborhood" have emerged in the literature, emphasizing the "smart" component of urban neighborhoods as factors that can contribute, from the smallest level of a city, to generating positive macroscopic effects (Li & Smeaton, 2014; Nakano & Washizu, 2021; Pahl *et al*., 2013). Residents, through their daily and repeated practices over time, can mitigate the effects generated by the carbon footprint by renewing their lifestyles and changing their consumption of natural resources and food and their use of everyday objects.

In this paper, we aim to turn our attention to the micro dimension of urban decarbonization, soliciting theoretical reflections on the spatial causes that can influence sustainable and pro-environmental behaviors. More specifically, we aim to investigate the role of the social, physical, and symbolic urban environment in influencing pro-environmental behaviors (PEB) in citizens at the neighborhood level. While this subdivision of urban space constitutes the smallest level of analysis of cities, neighborhoods also represent small communities with their own identity, architectural features, social vitality, and amenities; thus, neighborhoods are a sort of small city within a city and, together, make up the overall nature of the city itself. Neighborhoods, through such co-presence of resources and elements, can produce phenomena of social and cultural innovation, including new consumption trends and practices (Semi, 2015; Zukin, 1995). The hypothesis advanced in this article is that the neighborhood, framed as a multidimensional phenomenon (Galster, 2001), may be able to influence individuals' sustainable behaviors. In the complex set of variables that may act causally in the solicitation of these types of virtuous attitudes, an interpretive model called "NPSB" (neighborhood-perception-sustainable behaviors) will be proposed at the end of the article. The model relates the neighborhood to its material and immaterial characteristics (genius loci, quality of the urban environment, and culture), the perception of these characteristics by individuals (place attachment, environmental evaluation, and residential satisfaction), and, finally, the social outcome of sustainable behaviors (pro-social behaviors, pro-environmental behaviors, and circular behaviors). This model aims to provide a theoretical framework for understanding the involved process and has not yet undergone experimental verification. Therefore, this is the perspective from which it should be understood.

1. The interaction between a neighborhood's environment and its residents

Analyzing the neighborhood as a driver of social innovation and sustainable behaviors means looking at the city and selecting a small part of it—a portion of the territory that by social, physical, and identity characteristics makes itself autonomously distinguishable from other neighborhoods. Turning attention to the neighborhood, then, means focusing on that part of urban space that physically interfaces with groups of individuals: significant places, buildings, and, in general, all those architectural and urban structures in which the life of the urban citizen must measure itself daily (Dezi *et al*., 2018). The neighborhood, due to its limited territorial extension, becomes associated with the idea of community. Indeed, urban sociology has a long tradition of conducting studies on urban neighborhood communities, which have highlighted how within the smallest component of the city, social networks, relationships, and opportunities for individuals and groups to develop new lifestyles and social innovation are built (Flanagan, 2010; García *et al*., 2015; Moulaert, 2010; Moulaert *et al*., 2010; Moulaert & Van den Broeck, 2017; Van Dyck & Broeck, 2013). The neighborhood not only constitutes an urban sub-community where a wide variety of populations share the same space, but its multidimensional nature, both material and

immaterial, interacts with the subjectivities of its members, soliciting imaginary, perceptions, and evaluations (Costales & Zeyen, 2022; Hoseini & Mokhtari, 2013; Hyman, 2002; Rollero & De Piccoli, 2010; Ujang, 2012; Zhu, 2015).

Given the high complexity of the nature of a neighborhood, the best way to attempt to reduce this vagueness lies in framing it as an object that incorporates multiple dimensions within itself. In this sense, the definition proposed by Galster (2001) is very useful for the purposes of this article. According to the scholar, a neighborhood should be understood as a place where multiple dimensions coexist and are strongly intertwined. This idea refers to the physical infrastructural component of the urban space, the sociodemographic structure, the types of classes of resident populations, the environmental qualities, the quality of the public services, the political characteristics, the quality of sociality and social vitality, and the affective dimension, which includes the concept of "genius loci" that will be discussed later. Framed in this way, we realize that the neighborhood is something very close to an "organism," enabling the growing of the city itself thanks to the interaction between citizens' social practices and the "non-human" dimension of urban spaces (Searles, 1960). On the other hand, as far as social-level effects are concerned, there is evidence that the perceived quality of the neighborhood enables specific human behaviors, such as community participation (Bottini, 2018; Zhu, 2015), the propensity to prefer sustainable ways of urban mobility (Caiello & Bottini, 2020; Leyden, 2003) and focusing on health and subjective well-being (Galster, 2014; Sampson, 2003; Veitch *et al.*, 2012). There is evidence that the perception of the neighborhood in its complexity and multidimensionality (Galster, 2001) can influence not only the cognitive dimension but also the practices implemented by individuals. In a way, living in a specific context with specific characteristics can generate in individuals a greater inclination towards a specific social action.

The topic of perceiving the spatial characteristics of the neighborhood is associated with another equally relevant issue concerning the affective dimension of individuals in relation to the urban living environment. This refers to the place's ability to evoke attachment development (Lewicka, 2008; Livingston *et al.*, 2003)Lviv (Ukraine, previously Lwo, Poland, influenced by multiple variables such as exposure time to the place, including length of residency (Lewicka, 2005, 2011) postulated in literature, between place attachment and civic activity, the other is the sociological claim that there is a negative relationship between place attachment and a person's social and cultural status (cultural capital. Among the factors that induce individuals to develop place attachment, there can be a sense of identification with the place itself, which is referred to in the literature as "place identity" (Iv *et al.*, 1994; Rose, 1995), connected to the genius loci. The phenomenon has intersected studies in social sciences (Barnes, 2004; Neri, 2001) and architecture and urban planning (Norberg-Schulz, 1980). This is not the appropriate context to extensively discuss the concept of genius loci in urban sociology studies; however, it is worth mentioning its rediscovery in territorial studies as an intangible factor with limited scientific understanding but that is expressed through feelings and practices of an associated group of individuals within a spatial context. Genius loci can be framed as the most intimate part of a place that stands as the outcome of a constant layering of practices and uses happening over time. Such intimate heritage attached to a place solicits affection and bonding in the population that inhabits it, consolidating relationships among community members through a form of "syncretic sociality" (Bleger, 1967). The idea that places can solicit the development of a shared identity and a sense of belonging allowing a group to recognize themselves has thus also appeared elsewhere in the social sciences. However, there is no consensus among scholars for a reliable and solid definition of genius loci useful for sociological research. This is due to the high complexity of the concept and its empirical comprehensibility.

Overall, the material and immaterial factors we have illustrated above set the basis for a neighborhood that generates a vibrant context. This vitality is a crucial ingredient for initiating social innovation processes that guide urban neighborhoods towards a sustainable identity aligned with decarbonization processes – a fundamental objective for future smart cities.

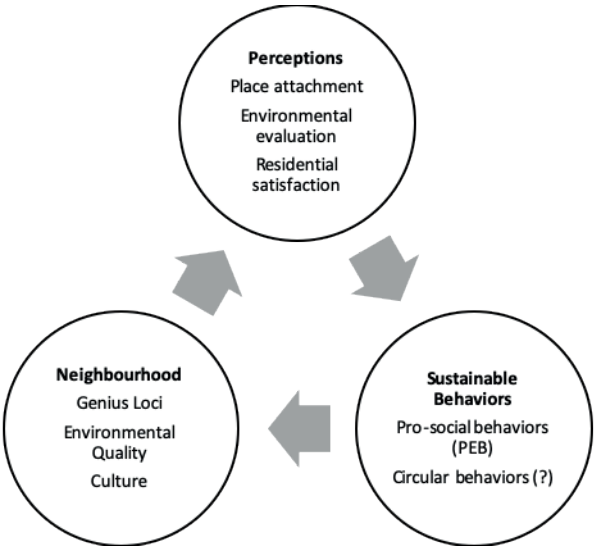
2. Neighborhood and pro-social behaviors

In the previous section we pointed out that the neighborhood, in its material and immaterial multidimensionality, interacts with the community of inhabitants, both at the individual and social levels.
The achievement of environmental sustainability goals at the neighborhood level can be attained by focusing attention on virtuous behaviors aimed at improving collective well-being. In this regard, the concept of "pro-sociality" is introduced. Pro-sociality can be defined as the propensity of individuals to contribute for the good of their neighbors and for the good of the community (Brief et al., 1986; Eisenberg & Miller, 1987; Fang et al., 2022; Lenzi et al., 2013). Within this category, individuals exhibit a degree of willingness to act for the cause at hand by infusing more or less energy and increasing the cooperation of other individuals (Fang et al., 2022). Thus, the propensity to act in this way is not necessarily total but has different intensity within the individuals. In the wide range of such phenomena that individuals can enact, we mention pro-environmental behavior as environment-oriented pro-social practices (Neaman & Mariò, 2015), defined as behaviors that individuals implement to reduce the environmental impact of human actions on the natural and artificial world, such as reducing energy consumption and waste generation (Kollmuss & Agyeman, 2002). Research has, indeed, shown an association between pro-social preferences and PEB (Andre et al., 2021; Fuhrmann-Riebel et al., 2021), documenting a tie between individual attitudes toward pro-sociality and the enactment of pro-environmental behaviors. If pro-sociality is somehow a precursor to certain attitudes, it is necessary to clarify the association that exists between the multidimensionality of the neighborhood and the pro-sociality of individuals. In this regard, the evidence accumulated so far seems to respond positively to this possibility. Lenzi et al. (2012) verified the existence of a link between the social resources of an Italian neighborhood (social cohesion, social opportunities, place attachment) and the encouraging of pro-sociality in a sample of adolescents. Similarly, PEB is associated with the level of perceived urban stress and local identity (Meloni et al., 2019), the rhythm of urbanization of the city (Qing et al., 2022), and, more relevantly, place attachment (Carrus et al., 2014; Scannell & Gifford, 2010; Song & Soopramanien, 2019). The spatial dimension, linked to the socio-physical context of the neighborhood (Stokols & Altman, 1987), fully falls within the variables capable of influencing a type of pro-social behavior such as PEB.
Insisting on this concept and its relation to PEB phenomena, Kaida (2015), for example, conducted a study on the propensity to act pro-environmentally, distinguishing it into three types of pro-environmental action and the degree of attachment of cases collected within a survey. Attachment was measured referring both to the living neighborhood and to the city in general. The study revealed the presence of a greater propensity to act pro-environmentally in those who possessed a specific attachment to the neighborhood rather than to the city, confirming how social life at the urban neighborhood level can create the environmental conditions for virtuous pro-environmental behaviors to arise. The empirical evidence thus seems to confirm two facts: on the one hand, that the role of the urban and social neighborhood environment can foster pro-social attitudes, and on the other, how, within this context, specific behaviors aimed at sustainability issues can take shape. Neighborhood attachment is among the most interesting variables that the literature is gradually confirming as a driver for PEB.

3. The "NPSB" model (Neighborhood-Perceptions-Sustainable Behaviors)

In light of the evidence described so far, this section intends to present a summarizing scheme enabling a general overview of the phenomenon here analyzed. Schematically, the following process is intended as follows:

Fig. 1 – The "NPSB" model (Author: Luca Bottini)



The proposed model constitutes a possible interpretation of what happens in reality, and the likelihood of the phenomenal outcome must be understood not in a linear but in a probabilistic sense. The process should be interpreted as follows: the multidimensional nature of a neighborhood interacts with individuals, influencing their cognitions and emotions (i.e., place attachment, residential satisfaction, environmental evaluations). Then the individuals' perceptions can turn into sustainable behaviors, acting pragmatically for the sake of the community, improving the quality of the neighborhood itself. Below, we will discuss each of the components of the NPSB model.

3.1 Neighborhood

As seen, the neighborhood constitutes an object that is both material and immaterial, in which remarkable functions and additional objects converge, making the neighborhood a "place" instead of a "space." There is something symbolic and non-material that is collectively recognized by the members of a neighborhood, but it cannot be directly measured and seen. As seen above, the genius loci constitutes that invisible and empirically challenging-to-identify factor that can serve as the basis for identification between individuals and the spatial context of reference. The genius loci is thus the first factor of a neighborhood that constitutes the fundamental variables regarding the neighborhood for the model. The second proposed factor is represented by the perceived quality of the neighborhood, which refers to the average evaluations of the socio-physical characteristics perceived by the residents of the neighborhood. This includes satisfaction with the built environment (Fornara *et al*., 2010) and residential satisfaction (Gan *et al*., 2019; Grillo *et al*., 2010). These factors, all together, give a useful account for understanding how the neighborhood environment is perceived as positive or negative by its residents. Finally, the third factor concerns the cultural and identity dimension of the neighborhood. In a city, neighborhoods represent the element which tells the story of urban multiculturalism and the individual stories of social and urban development that have shaped the trajectories of urban neighborhoods (Harding & Hepburn, 2014; Rosenstein, 2011; Semi, 2015; Zukin, 1995)" Genius loci, quality of the urban environment, and culture are therefore three factors that, together, constitute the first element of the presented cyclical NPSB model.

3.2 Perceptions

The second step of the NPSB model concerns the processing of individual perceptions of the neighborhood. At this phase of the process, the community interacts with the multifactorial resources of the place, processing ideas, imaginary and evaluations of the features that constitute the living neighborhood. This is a process that requires constant exposure and sufficient residence time to become familiar with the environment and reach a degree of knowledge that allows for the elaboration of an overall assessment (Bonaiuto *et al.*, 1999; Hidalgo & Hernandez, 2001; Sampson, 1988). The perceptions that individuals activate in relation to the neighborhood are the result of a bidirectional interaction between the socio-physical environment and mental cognitions. This relationship has been theorized by environmental psychology through a transactional paradigm, where the environment influences human behavior and vice versa, in an exchange that involves both individuals and their environments (Bonnes & Secchiaroli, 1992; Gifford, 2002). The perception of the neighborhood and its multidimensional characteristics, as mentioned earlier (Galster, 2001), is not an end in itself but interacts with the inner world of individuals and their beliefs and ideas about the living context. These factors, in turn, represent the foundations that guide individuals' behaviors. In this sense, the works of Ajzen are useful for framing the process that influences the production of behaviors by individuals (Ajzen, 2005). Ajzen's Theory of Planned Behavior posits that three kinds of beliefs influence the production of behaviors: a) behavior beliefs, b) normative beliefs, and c) control beliefs. The world of perceptions, therefore, influences the practices and social behaviors of individuals in neighborhoods, either facilitating or hindering them. Naturally, the reasoning proposed here assumes that the emergence or absence of behavioral intentions of a certain type, such as pro-social attitudes, has a probabilistic nature. Thus, reasoning in linear and deterministic terms is not effective for understanding the subject of this article.

3.3 Sustainable Behaviors

The perception of the neighborhood by individuals can influence behaviors and social practices toward it. Among the possible behaviors that members of the neighborhood community may enact, we have placed emphasis on the phenomena of pro-sociality to PEB. In light of the literature presented earlier, in the model presented here we hypothesize that based on the genius loci, environmental quality, and cultural aspects of the neighborhood, citizens develop a virtuous way of managing natural resources in daily life as well as the neighborhood itself. The final effect hypothesized here, in fact, predicts that the behaviors implemented by the so-called "active" inhabitants are aimed at maintaining a high level of quality in the urban environment and that the behaviors themselves trigger a self-feeding virtuous process. Within this phase of the process, a question mark has been put on "circular behavior" (Ali & Choe, 2022). Unfortunately, the effects of the urban environment in enabling circular behavior still need attention by the scholars. Although, following the NPSB model, the probability to find out an association between the neighborhood's characteristics and circular behaviors performed by the citizens could be hypothesized. This hypothesis might be motivated by the fact that circular behavior can be included in the general category of environmental behaviors, which are strongly connected to the environment's characteristics, as highlighted previously.

The NPSB model summarizes the interaction process that, starting from the multidimensional nature of the neighborhood, leads to social behaviors and passes through the cognitive processing of its material and immaterial characteristics. This model should be interpreted as a possible framework that shows how, by interacting with the fundamental characteristics of the neighborhood, individuals' perceptions can foster virtuous attitudes for the sustainability of the neighborhood itself. It is a theoretical model that needs to be empirically verified in the field, and the

relationship between the elements of this process does not aim to frame the phenomenon in a linear sense but rather in a probabilistic sense. Considering this logical premise, the model is represented in a cyclical manner as the elements involved in the process act upon each other, either positively or negatively. Favorable qualitative conditions of the neighborhood can prompt positive perceptions and increase the likelihood of generating positive behaviors in favor of the neighborhood. Such practices, in turn, can influence the entire process from its inception and thus contribute to the improvement of neighborhood conditions because of the positive practices implemented by residents who act in this way.

Conclusions

This article discussed the role of urban neighborhoods in promoting sustainable behaviors in future smart cities. Research on smart cities in recent times has been strongly driven to delve into the role of environmental sustainability in the construction of future smart cities. While most scientific reflections, even in the sociological field, focus on the macro dimension of the problem, investigating more sustainable policy practices, management, and urban development strategies, in this article a micro approach has been proposed. The main reason rests on focusing the attention on the city in its spatial, social, functional, and technological multidimensionality. This substrate, both physical and symbolic, is the result of the complex composition of smaller territorial units, i.e., the neighborhoods, which, together, constitute the backbone of a city. Investigating the micro level means taking a horizontal gaze and observing what happens between the members of an urban community and their physical environment of reference. The challenge of the future of smart cities is also and, we might say, especially played out at this level. Indeed, it is through social networks and interaction with individuals that the conditions are generated to propose phenomena of social innovation and sustainability.

In this sense, an interpretive model named "NPSB" (Neighborhood-Perceptions-Sustainable Behaviors) has been presented with the aim to frame the interaction process that takes place between the neighborhood and the cognitive/emotional processing of its inhabitants as premises for social outcome manifested by behaviors. Since we are interested in understanding whether the quality of the urban environment of neighborhoods could have a relationship with the issue of sustainability and urban decarbonization, we focused on pro-social behaviors, specifically pro-environmental behaviors. From the reconnaissance of the empirical evidence that has emerged so far, among the many variables involved, attachment appears to be the most important. Place attachment is directly linked to the concept of the "soul of a place" and thus the "genius loci," highlighting how in the realm of spatial perceptions, the imagery and affective emotions developed by individuals residing in a neighborhood are effective and constitute an important object of investigation in the field of urban sociology. The specialty and uniqueness of the neighborhood and the complex world of individual perceptions are the triggers for the emergence of PEB in the community of individuals in the neighborhood. So, the phenomenon of caring behaviors toward the urban environment and for a more sustainable use of natural resources (thus providing a contribution to decarbonization) is also rightfully part of the analytical reflections on the future of smart cities so that they are greener and more sustainable.

Finally, the end point of the considerations made so far involves urban development policies. Neighborhood care, which happens, at least partially, informally through bottom-up practices of social innovation originating from the neighborhoods themselves, is the main object of governance of local governments. Urban regeneration operations are very delicate phenomena that constitute a great opportunity to improve the physical quality of a neighborhood, as well as serve as a moment when social development, the organization of commercial and service offerings on site, can be rethought to converge as much as possible with citizens' needs. In this

sense, urban care policies have an indirect nexus with the process of development of quality of life in contemporary cities' neighborhoods and thus also with the processes of elaborating individual environmental quality that solicits the affective bond between residents and their urban living environment. Finally, the level of urban environment quality can predict the likelihood of sustainable behaviors. As can be thus understood, the action of territorial government is not only made explicit at the visible level through the choices of transformation of urban space made by the various successive administrations, but it also interacts with the lives of residents. Urban development policies at the minimum level of the neighborhood actually affect citizens' perceptions, imaginary, residential satisfaction and, ultimately, their sustainable behaviors for the neighborhood. The proposed NPSB model in the article attempts to bring together all these elements as part of the complex process that, starting from the interaction between citizens and the living neighborhood, can lead to pro-environmental social practices for better future smart cities. It is a theoretical model that would need to be empirically tested. The lack of evidence in this regard constitutes, in fact, both the main limitation of the article and at the same time the starting point for future development of what is described here.

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Investigating urban inequalities in a climate crisis scenario: the contribution of Big Data to environmental justice studies[2]

Introduction

The foundation of this paper lies in the notion that cities serve as a pivotal "battlefield" in confronting contemporary environmental challenges. Climate change poses significative threats for urban landscapes and communities living in urban space. On the one hand, today's challenges have significant continuities with classical urban issues: cities have always been spaces of conflicts, contradictions, inequalities. Environmental issues represent one of the many stressors of urban dynamics; conflicts on the locations of polluting sites, for example, have developed over the last fifty years, intertwined with segregation and discrimination processes. On the other hand, environmental policies, framed as "sustainability policies", often contribute to reproducing or generating urban inequalities, shaping an unjust transitions.

In this paper, these two aspects are analysed within the environmental justice framework, favouring a socio-spatial perspective: risks associated with climate change are not "the same for everyone", in every place and time, contingent on a multitude of contextual factors. Moreover, the paper also explores how sustainability urban policies can yield secondary effects on the socio-spatial dimensions of climate and environmental justice.

Furthermore, research in the field of the so-called "new orthodoxy of green planning" (Connolly, 2019) highlights an unequal distribution of climate "goods" and "bads"; such orthodoxy is rooted in an entrepreneurial perspective, drawing on the contemporary narrative of ecological modernization which describes a vision of ecologically and socially responsible urban development and a technocratic and politically neutral approach to the resolution of environmental problems (Cucca, 2020). However, the "acritical" approach to sustainability and sustainable urban development is not able to recognize the contradiction implicit in its own premise: «that we can stimulate economic growth while mitigating the effects of climate change, without any sacrifice» (Checker, 2020). The spatial effects of urban strategies (e.g., urban greening, resilience planning) become evident in terms of exclusion, marginalization, or displacement of low-income residents. Such geographies of injustice often reflect the uneven distribution of population and social groups in urban spaces due to economic and social processes such as residential segregation and spatial concentration of poverty.

The investigation of the social and spatial structure of the city and the inequalities within it, from a climate justice perspective, has made wide use of the classic sociology toolbox, using both quantitative (census, official statistics, surveys) and qualitative (interviews, participant observation, newspapers, archival) data, at times integrated with GIS techniques of mapping and spatial analysis. As many scholars emphasized, Big Data should be seen as complementary to the "small data" produced by more traditional methodologies, creating new opportunities for empirical research on new and "old" issues. Despite the increasing utilization of big data in sociological research, its application to combat environmental injustices has been relatively limited. Nevertheless, big data holds considerable promise as a research tool in this endeavor.

The purpose of this article is to show how these new tools offer innovative possibilities for empirical research at the micro-urban scale, crucial in the field of environmental and climate justice, for example, in the analysis of social inequalities related to spatial patterns of individuals and community, vulnerability to natural hazards, and displacement processes related to the impacts of disasters or driven by urban sustainability policies.

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In order to show the contribution of big data - and their fruitful integration with data produced from traditional empirical methods - the case of the Boston Area Research Initiative (BARI, https://cssh.northeastern.edu/bari/) will be presented and discussed. The BARI's example, in our opinion, not only demonstrates how new methods and tools can enrich social and urban research, and the fruitfulness of research practices characterized by their multidisciplinarity and the ability to make many urban actors work together, involving the community.
The paper is structured as follows: in the first part of the work, a literature review on environmental and climate justice studies is presented (par. 1), focusing on its lasting interest in spatial inequalities and discrimination processes (par. 2). In a climate crisis scenario, such perspective proves to be still valuable, permitting to deepen our understandings of vulnerabilities and recovery processes in the aftermath of disasters and climate change hazards. Vulnerability, the political and social condition that affects a community's ability to prepare, respond, cope, and recover from a hazardous event, is socially and spatially unevenly distributed, intertwined with a system of inequalities structured on several axes (e.g., race, class, and gender) (par. 2.1). In recent years, climate mitigation and adaptation strategies, as well as the resilience framework shaping urban planning, have emerged bringing with them both benefits and costs that may prove to be "unjust" in several ways (par. 2.3).
For the most part, in this article, the concept of resilience is read critically, underlining how a resilient socio-ecological system could legitimize, reproduce, and reinforce the status quo, widening pre-existing inequalities at the social and spatial level. Secondly, the risk for climate policies, or -more broadly- "sustainability" policies, can become drivers for new forms of inequalities. In this regard, the selected literature on "environmental", "green" or "climate" gentrification highlights the spatial dimension of environmental justice: some segments of the population are directly or indirectly unable to take advantage of certain environmental resources, infrastructures and services (e.g., regenerated areas, urban green spaces). Research on ecological gentrification shows the environmental disadvantage emerging in socio-spatial processes of exclusion, marginalization, and displacement - as well as the environmental privilege in terms of accessibility to greening developments for more affluent social groups (the "green space paradox", Wolch *et al.,* 2014).
Building on the literature review developed in spatial-oriented perspectives, the last section of this work (par. 3) is aimed to a) show/address the methodological contribution that the use of big data can provide to environmental and climate justice studies, thereby, improving the sociological understanding of socio-spatial dynamics within urban systems; b) illustrate how new analytical tools, such as Big Data or ecometrics, can be used to inform local policies and strengthen cooperation between activists, citizen, administrators, and academics in tackling inequalities within the urban fabric. For this purpose, the experience of the Boston Area Research initiative is presented as a significant research itinerary integrating data produced from traditional empirical methods, "ecometrics", big data, and administrative data - tools that, when applied, affirm the need to design place-based policies able to recognize and enhance contextual characteristics, moving away from a 'one-size-fits-all' approach.

1. The battlefield of environmental justice

Environmental justice originated in the 1970s within the United States, sparked by grassroots movements that sought to combat racial segregation and discrimination targeting minorities in American cities. Environmental issues were framed as part of the civil rights movement claims: activists realized, before social science scholars, that environmental "bads" distribution was spatially and socially uneven, disproportionately situated in black and low-income neighborhoods. Inequalities related to living conditions, as concerns, for example, different exposure to industrial pollution or different urban sanitation conditions, are not a novelty of the Twentieth Cen-

tury: as some authors note, the entirety of human history can be read from an environmental (in)justice perspective (Pellow, 2000). Already in pre-modern times, urban waste tended to be concentrated in neighborhoods inhabited by marginalized populations (Melosi, 2005), with this condition assuming unprecedented dimensions with the Industrial Revolution and contemporary, fast urbanization processes, causing a «tremendous environmental change in the cities» (*ibidem,* p.6). Friedrich Engels, in his inquiry into *The Condition of the Working Class in England*, remarked how the upper class used to live «in free, wholesome country air, in fine, comfortable homes,» far -also visually- from «the filth, ruin, and uninhabitableness, the defiance of all considerations of cleanliness, ventilation, and health» of Manchester working-class districts:

> «the members of this money aristocracy can take the shortest road through the middle of all the labouring districts to their places of business, without ever seeing that they are in the midst of the grimy misery that lurks to the right and the left. For the thoroughfares leading from the Exchange in all directions out of the city are lined, on both sides, with an almost unbroken series of shops, and are so kept in the hands of the middle and lower bourgeoisie, which, out of self-interest, cares for a decent and cleanly external appearance and can care for it.» (Engels, 1987).

Proximity to polluting industries, waste storage sites, and contaminated land has always been a "privilege" of the marginalized. Nonetheless, a significant turning point in the history of environmental justice emerged in relatively recent times when the ecological sensitivity that inspired early environmental groups merged with the demands of the civil rights movement. This step enabled overcoming the "elitism" that characterized early environmental movements, which primarily focused on wildlife preservation, resource conservation, and pollution reduction and were driven largely by white middle and upper classes, with significant economic, cultural, and social capital (Bullard, 2000).

In literature, the emergence of the environmental justice movement is attributed to two central events. The first, exemplifying the Anti-Toxic Movement (Brulle & Pellow, 2006), involved the mobilization of Love Canal citizens (Niagara Falls, New York State), during the late 1970s. The construction of several houses and a school near a massive toxic chemical landfill caused significant health damages for hundreds of residents. This disaster led to the evacuation of more than 800 families thanks to the mobilization of numerous community organizations and had major repercussions on political and public opinion (Armiero, 2017; Fletcher, 2003; Schlosberg, 2007). The second event, which «put 'environmental racism' on the map» (Bullard, 2001, p. 151), is the 1982 Warren County (North Carolina) protests. A coalition of citizens, civil rights activists, and environmentalists mobilized against the siting of a PCB (polychlorinated biphenyls) landfill in one of the state's poorest counties, two-thirds of which was inhabited by African Americans (Goldman, 1996; McGurty, 1997). The Warren County protest led to the first critical report on environmental equity and hazardous waste. In 1983, a survey conducted by the United States General Accounting Office in eight Southern states revealed that three out of four hazardous waste landfills were situated in predominantly African-American communities, despite African Americans comprising only 20 percent of the population in that region (Bullard, 2001). The Warren County mobilization is cited in literature as a 'watershed' event for the environmental justice movement, as it represents one of the earliest instances of collaboration between civil rights activists and environmentalists working together on shared concerns (Schlosberg, 2007).

Inspired by these social movements and in close connection with them, a composite academic environmental justice field has emerged, dealing with environmental risks at different spatial and temporal scales. Different disciplinary lenses have been involved (historical, sociological, geographical, politological), and different theoretical and methodological perspectives have been developed (Maung & Pellow, 2021). Environmental justice studies have shown the uneven distribution of causes and effects of pollution and other environmental risks on different class and ethnic/racial groups, simultaneously making the environmental justice movement a subject

for research (Timmons Roberts *et al.,* 2018). Moreover, researchers are often personally involved in environmental social movements in various forms, ranging from militancy to consulting, aimed at providing scientific support for activists' claims.
However, we would like to emphasize how environmental justice, from its very beginning, adopted an explicitly spatial approach to environmental issues: waste disposal sites, polluting industrial installations, and other "problematic" facilities become a politically relevant issue precisely in relation to their top-down established localization, questioned by local communities. NIMBY (*not in my back yards*) opposition movements, whose ability to affect policy-makers' choices is limited and in any case unequal, perfectly fit in this framework: «whiter communities were more successful than people of color in campaigning against the toxic site» (Maung & Pellow, 2021, p. 38). Plus, the "victory" of a NIMBY claim may simply result in relocating the "contested" site to a different location, inhabited by communities less able to oppose it, for many reasons.

> «the hazardous wastes, garbage dumps, and polluting industries were likely to end up in somebody's backyard. But whose backyard? More often than not, these locally unwanted land uses (LULUs) ended up in poor, powerless, black communities rather than in affluent suburbs. This pattern has proven to be the rule, even though the benefits derived from industrial waste production are directly related to affluence. Public officials and private industry have, in many cases, responded to the NIMBY phenomenon using the "PIBBY" principle, "Place in Blacks' Back Yards"» (Bullard, 2019)

Black and low-income neighborhoods are on «the 'wrong side of the tracks', and subsequently receive different treatment when it comes to enforcement of environmental regulations» (Bullard & Wright, 1987, p. 25). The existence of a link between environmental inequality, socioeconomic status, and race/ethnicity has been discussed widely in literature since the 1980s, but race and income are still crucial factors in the location of hazardous waste facilities and unequal exposure to pollution (eg., Bullard *et al*., 2008; Sampson & Winter, 2016; Tessum *et al.*, 2019)
As Mohai and Saha summarize (2007), the "existence" of an unequal distribution of hazardous sites can be the outcome of three processes: a) *economic*, such as economic actors will to minimize costs by occupying lower-value land parcels, often coinciding with those occupied by minorities and the poor; the "getaway" of (white) wealthier residents, resulting from the location of polluting sites, is another example: the collapse of property values in the affected neighborhood makes room for the "arrival" of less affluent residents; b) *sociopolitical*: decision-makers and private investors location choices tend to penalize communities with weaker political voice, less social and economic capital, identified as less able to mobilize against these choices; c) *racial*, pertaining not so much to an explicit desire to locate polluting sites in ethnic minorities, out of an explicit racist choice, but rather to the long history of identifying black neighborhoods as less likely to resist government or industry choices (Bullard & Wright, 1987), less capable of lobbying. Moreover, residential segregation reduces poor and black people's ability to move "out" when environmentally harmful structures are placed near their homes.
However, it is essential to flesh out and elaborate on the contours and subcategories of *justice* (and its intrinsic relationship with inequality) and how it is defined in environmental justice literature. As several authors have made clear, three are the dimensions considered (for a summary, Schlosberg, 2007):

- *Distributive* justice: emphasizes how the causes and effects of environmental degradation affect social groups and places differently, with environmental policies tending to favor some populations and territories' interests, while others may be penalized;
- *Procedural justice*: refers to the "openness" and degree of transparency in decision-making processes, the possibility for different actors to "voice" in agenda-setting and decision-making processes, as well as the power effectively devolved to participatory processes (against the risk that they are simply asked to "validate" pre-made decisions).
- *Recognition* justice: concerns the failure to recognize individuals, territories, or cultures' specific

features; this is one of the leading causes of distributional and procedural inequality, as it leads to the exclusion of individuals and groups from decision-making processes and a failure to consider their aspirations and needs in policies.

During the 1990s 2000s, environmental justice spread horizontally -to include different areas of the planet – and vertically – to link global protests and local mobilizations (Walker, 2012). On the one hand, it prioritizes the distributional consequences of neoliberal politics of scaling and the new processes of "accumulation by dispossession" (Harvey, 2003) and on the other hand it focuses on patterns of socio-spatial and environmental inequality, and the processes through which these inequalities are produced (Cook & Swyngedouw, 2012; Pellizzoni, 2014).

2. Spatial patterns of environmental and climate justice. Vulnerability to climate change hazards

As the environmental justice movement expanded globally, climate change gained growing prominence in scientific discussions, public spheres, and policy agendas, emerging as the most pressing environmental issue of the 21st century. The environmental justice framework has proved highly fruitful for researchers and grassroots movements engaged in climate change "front".
Climate change thinking has led to the adoption of international perspectives and organization structures, more suitable for discussing globalized capitalism and its downsides, where global warming and climate change have their roots. Thus, for example, critical thinking developed about the "emissions quota market" established under the Kyoto Agreement, emphasizing how

> «dynamics of capital accumulation are creating a carbon space-economy based upon the enclosure (in 19th-century terms) of non-polluted air, oceanic carbon-absorption capacity, land, forests, social commons and indigenous knowledge [...] carbon trading represents at best a shifting of the deck chairs on both the climate and economic Titanics, and at worst -and most probably- will suffer from major new holes in the ships» (Bond, 2012, p. 689).

New environmental commodities create new opportunities for accumulation through dispossession, widening the global North-South gap and the inherent inequalities (Böhm *et al.,* 2012).
In this framework, climate justice's contribution focuses on the asymmetries implicated in climate change, concerning its causes, its consequences, and how public policies manage it, ranging from global to local scales. Risks associated with climate change are not *the same for everyone* in every place and time and are highly dependent on numerous contextual factors. Throughout the following pages, this work focuses on the "persistent relevance" of urban fractures, contradictions, and resources for cities' environmental challenges.
In the same way environmental justice's origin is often traced back to the Warren County protests, a pivotal turning point for the intersection of environmental justice and climate justice is generally recognized in Hurricane Katrina, which struck the U.S. Gulf Coast in August 2005: the collapse of levees and floodwalls installed to protect the city of New Orleans (Louisiana) caused the flooding of roughly 80 percent of its surface area and the deaths of approximately 700 people[3].
Literature has focused its theoretical and empirical efforts on "denaturalizing disasters" (Pelling,

3 Schlosberg and Collins (2014), however, specify that «there was a relationship emerging before that particular storm. The Environmental Justice and Climate Change Initiative was founded in 2001 [...] The initiative straddled this global focus and its US emphasis; its membership included a diverse group of "environmental justice, climate justice, religious, policy, and advocacy groups that represent hundreds of communities" that laid out 10 principles of climate justice in 2002. This is crucial: an environmental justice organization, before Katrina, defined key principles of climate justice based in the experience of environmental justice communities in the United States».

2001) against a reductionist view of "natural disasters" being limited to mere physical and material dimensions. By emphasizing the deeply intertwined nature of human and social factors in shaping disasters' consequences, it has been argued that «there is no such thing as a natural disaster [...] the contours of disaster and the difference between who lives and who dies is to a greater or lesser extent a social calculus» (Smith, 2006). Natural hazards, mediated by many individual, social, and contextual factors, can turn into socio-natural disasters.

Several studies have shown that «the unequal distribution of vulnerability to climate change is therefore exacerbated by pre-existing inequalities» (Adger, 2006, p. 274). Vulnerability, the political and social condition that affects a community's ability to prepare, respond, cope, and recover from a hazardous event, is socially and spatially unevenly distributed, intertwined with a system of inequalities structured on several axes (among which race, class, and gender represent some important examples) (Cutter *et al.,* 2003).

On the global scale, the awareness of disequilibrium between countries responsible for the majority of the emissions and countries that, nearly blameless, experience the most damaging effects was already established at the beginning of the 21st century (in IPCC reports too). Many factors were identified as shaping developing countries vulnerability, including wealth, technology, knowledge, infrastructure, institutional capabilities, preparedness, and access to resources (Kasperson & Kasperson, 2001).

On the urban scale, climate "goods" and "bads" distribution is unequal, reflecting the uneven distribution of population and social groups in urban space due to economic and social processes such as residential segregation and spatial concentration of poverty. Some segments of the population are directly or indirectly prevented from accessing environmental resources, infrastructure, and services, such as urban green spaces, clean air, urban biodiversity, and eco-efficient housing. The link between residential segregation and the quality of the urban environment, identified in the context of classical environmental justice studies, is a valuable key to understanding new environmental issues, particularly climate change, and vulnerability (Cucca, 2020).

With regards to Hurricane Katrina's social impact, a crucial role is attributed to New Orleans' dramatic inequalities of the early 2000s and its «deep and complex relations of racial and class division» (Elliott & Pais, 2006, p. 297), with high residential segregation and an acute concentration of poverty, often within the same area (The Brookings Institution, 2005). Scholars discovered that poor and black communities had been strongly affected by flooding: 58 percent of residents living in flooded neighborhoods were African Americans or members of other ethnic minorities, compared to an overall share of 45 percent in the regional population. In New Orleans, this share raised an impressive 80 percent. At the same time, the average household income of those living in the flooded areas was approximately 15 percent lower than the residents of the "dry" areas ($44,000 vs. $53,000); again, a wider range characterized New Orleans, where the difference was 30 percent ($38,000 vs. $55,000). Furthermore, 38 out of 49 extreme poverty census tracts in the metropolitan area flooded, all in New Orleans (The Brookings Institution, 2005).

Andy Horowitz notes that although «racism and poverty are necessary beacons for navigating Katrina's history, because they structure American inequality, often leading to inequities so stark they can be fatal» (Horowitz, 2020, p. 7), they may prove to be insufficient in explaining "what happened" when Katrina hit the Louisiana coast. «When the levees broke, the homes of tens of thousands of suburban, middle class white people flooded catastrophically, while the homes of New Orleans' poorest African American residents, who lived in public housing, largely did not. There are no straight lines that connect racism or poverty to flood depths» (*ibidem*). Similarly, James Elliott and Jeremy Pais (2006) point out that exposure to flood risk, despite its uneven geographical distribution across the region (due to different elevations and availability of protection systems), cannot be traced solely to race or class factors: Katrina had a strong impact on neighborhoods inhabited by affluent, middle-class whites, too. Instead, a complex interplay of

class and race helps to explain the response of individuals and communities at different stages of the disaster (from "pre" to "post").
The historical analysis of urbanization processes and transformations that affected the New Orleans metropolitan area during the twentieth century becomes necessary to understand the geographical location of different groups and the observed impacts of the disaster, avoiding tricky simplifications (Campanella, 2007). The racial bias implicit in federal housing policies (which included redlining, segregation, and loans disproportionately aimed at whites), indeed, allowed the white middle class, between the 1930s and the 1960s, to relocate to new, higher-quality housing, exposed to greater risk of flooding (Horowitz, 2020). During the 1960s and 1980s, the phenomenon of white "exit" (white flight) from the historical boundaries of New Orleans surged, driven by suburbanization facilitated by novel reclamation and physical landscape transformation processes.
This long-term perspective, thus, emphasizes the centrality of urban processes in shaping the vulnerability of individuals and groups to climate extremes. Moreover, it shows how vulnerability is socially constructed well before disasters take place.
Eric Klinenberg, renowned for his famous "social autopsy" of the 1995 Chicago heat wave (Klinenberg, 2002), advocates for a socio-ecological approach to understanding vulnerability. His study explores the environmental and social factors that influence residents' varying likelihood of survival. Demonstrating that «the patterns of mortality reflect the inequalities that divide Chicago» (*ibidem*, p. 18), Klinenberg rejects the idea that the city's residents are "all in the same boat" when facing the heat wave: deaths are predominantly among African American and elderly populations. In every age group, African Americans show a higher mortality rate than any other ethnic group in the city. Geographically, communities with the highest death rates were concentrated in the city's South Side and West Side, revealing a «clear clustering of deaths in Chicago's segregated black regions» (*ibidem*, p. 82). The presence of low-income and elderly populations, lack of vegetation, and high crime rates are all ecological characteristics associated with high death rates.
The ethnographic work aimed at analyzing what we might call a "neighborhood effect" (Sampson, 2012; Sampson *et al.,* 2002), how living in a specific neighborhood may have led to an increased vulnerability to the heat wave, suggests that residents of poor, segregated and dangerous neighborhoods are at greater risk of dying alone because the context "discourages" them from leaving the "safe" space of the home and, at the same time, creates obstacles for the opportunity of finding some protection in neighborhood social networks. African Americans are the only ethnic group in the city segregated and ghettoized in physically degraded areas with high rates of crime and violence, lacking commercial infrastructure and places for socialization (Klinenberg, 2002).
Post-disaster redevelopment, too, is influenced by inequality structures and their spatial patterns. This results, for example, in different access to resources available for recovery and different "resilience capacities" of people and communities. In New Orleans, «we can view the unevenness of the pace and trajectory of the post-Katrina redevelopment as a result of the interaction between preexisting racial, class, and neighborhood disparities and inequalities in access to post-disaster recovery resources» (Gotham & Greenberg, 2014, pp. 169–171). The return of displaced households, for example, is not so much ascribable to individual wills, values, or personal abilities but should instead be read in connection with factors such as the social vulnerability of affected communities in different neighborhoods and the severity of the "physical" harm suffered (Finch *et al.,* 2010). Low-income African-Americans were frequently displaced in cities far from New Orleans: far from being an ineffective spatial feature of their "post-disaster" experience, this resulted in a deterioration of pre-existing family and community networks and much higher travel costs to return (without -in many cases- the opportunity to use a private car). Middle-class whites, vice-versa, were in most cases able to rent apartments in the suburbs or, otherwise, to find temporary accommodations not far from it. In addition, the flooding insurance rate among

New Orleans' population was not the same: again, individuals living below the poverty line and black people were less insured, whether for economic reasons or because of insurance redlining processes (Gotham & Greenberg, 2014). Frequently, post-disaster redevelopment projects become battlefields for heated debates about the future, with different ideas, narratives, and political positions clashing. In New Orleans, some explicitly hoped that poor people would not return to the city and "find some other place to live", others promised that the city would not return "as black as it was before". This idea of disaster as a process of creative destruction assumed the gentrification of New Orleans (labelled as "green", in some measure) as a newfound tool for the accumulation of capital (Cossman, 2007; Davis, 2005; Gotham & Greenberg, 2014; Horowitz, 2020).

3. Resilience and spatial inequalities: secondary effects of climate policies

Environmental justice, as explained above, is evident in the distributive geographies of burdens and risks related to the impacts of extreme natural hazards. Moreover, environmental policies can have significant secondary effects on the socio-spatial dimensions of climate and environmental justice. Climate mitigation and adaptation strategies involve benefits and costs that may prove to be "unjust" in a myriad of ways. The French *gilets jaunes* protests of 2018-2019 provide an example of a reaction to the government's implementation of a carbon tax on diesel fuel. This event demonstrates how a green policy, deemed distributionally, procedurally, and recognitionally unfair, led to a conflict where territorial inequalities played a crucial role. Suburban and rural areas with a working-class population heavily reliant on cars perceived the "center" as neglecting their needs. The significance of the intersection between space and social structure underscores the need for place-based, more just policies (Carrosio, 2022).

The spatial dimension of climate justice, thus, is also implied in the issue of policies implemented for the construction of "resilient" societies – societies able to deploy an adaptive change that aims to preserve the activities, functions, and structures perceived as "useful" (because they are sustainable or generate human well-being) in the face of climate change threats. The resilience framework has emerged in recent decades from "hard" natural sciences literature to acquire a transdisciplinary diffusion. Despite its wide use, however, it has its own limitations. In particular, resilience adopted as a merely "technical" notion has been criticized, as it would tend to hide behind a "claim of neutrality" the eminently political dimensions of choices guiding the transformations required to cope with the climate crisis (Pellizzoni, 2017). The resilience frame «can also allow unsustainable or socially unjust practices to persist» (Pelling, 2010, p. 56). Thus, a resilient socio-ecological system can legitimize, reproduce, and reinforce the status quo, widening pre-existing inequalities (Jennings, 2011).

Therefore, the following section focuses on one issue in particular: the risk for climate policies (or, more broadly, "sustainability" policies) to become drivers for new forms of "environmental", "green", or "climate" gentrification. The purpose of this work, however, coherent with the aim of this paper, is not that of analyzing the pros and cons of the whole sampling of urban sustainability policies that local administrators can deploy in their cities. Instead, this work aims to emphasize how a perspective aware of urban inequalities can inform policies aimed at making cities more "resilient" to climate challenges, avoiding the distortive effects of "space blind" policies.

In post-disaster contexts, as illustrated in the case of New Orleans, low-income and black neighborhood gentrification may become a precise choice to make the city "more livable". Nevertheless, also in "peacetime", expulsion processes can be encouraged by environmental and redevelopment urban policies.

If the unequal distribution of environmental "bads" and "goods" was the main topic for the environmental justice framework, environmental gentrification allows to dynamically understand

how urban processes promoted in the context of sustainable development and urban resilience can produce processes of displacement and exclusion. The focus is on how urban greening policies can make neighborhoods unaffordable for low-income residents rather than on how gentrified neighborhoods demand parks and other green infrastructure (Gould & Lewis, 2017).
Supported by international policies and research and innovation programs (e.g., Goal 11 of the Sustainable Development Goals, the Horizon Europe program, or, in the North American context, the EPA's Green Infrastructure Program), urban greening projects insist on the economic, ecological, social, and health benefits they bring, assuming cascading effects that would benefit all (Anguelovski *et al.*, 2018; Wolch *et al.,* 2014). Rarely, however, these projects explicitly address equity, providing concrete and contextual measures to ensure that ecological solutions benefit all residents, particularly the most vulnerable. Instead, territorial contexts are often seen as homogeneous domains where "one-size-fits-all" policies can be dropped from above (Castrignanò & Landi, 2018).
Research in this field critically analyzes the so-called "new orthodoxy of green planning" (Connolly, 2019) – highlighting its spatial effects in terms of exclusion, marginalization, or displacement of low-income residents. This orthodoxy draws on a contemporary narrative of ecological modernization, which simultaneously describes a vision of ecologically and socially responsible urban development, a "green" lifestyle (attractive for affluent and eco-conscious residents), and a technocratic and politically neutral approach to the resolution of environmental problems (Cucca, 2020, p.193). Sustainability becomes a brand aimed at increasing urban appeal to attract investments, events, highly skilled workers, tourists, and students.
Many scholars associate the new sustainability consensus with the "entrepreneurial turn" in urban governance (Harvey, 1989), especially with "sustainability fixes"[4]. Urban management has a growing interest in incorporating environmental issues in governance and planning, «but as long as the efforts required promote economic and interurban competitiveness» (Scanu *et al.*, 2021, p. 1371), essential to reproduce the expansive dynamics proper to neoliberalism through a process of "greening of the growth machine".
The literature on environmental gentrification has developed at first in North America and later in the European context, highlighting some differences between the two contexts: first, the broader role usually played by European public policies in promoting or containing gentrification; second, the average size of European cities, smaller than American ones, makes large-scale urban transformations unusual and thus tends to "blur" the ability of an "isolated" urban greening project to produce displacement processes (Beretta & Cucca, 2019).
Many of these studies focus on the limitations of an "acritical" approach to sustainability and sustainable urban development, unable to recognize the contradiction implicit in its own premise: «that we can stimulate economic growth while mitigating the effects of climate change, without any sacrifice» (Checker, 2020, p. 7). Melissa Checker, for instance, identifies three mechanisms of environmental gentrification that run through the history of New York City: a) *green gentrification* turns parks, gardens, and other urban green spaces into commodities that contribute to raising property values and reorganizing urban space according to wealth and privilege, thereby denying minorities and low-income residents access to such resources. The emphasis on "sustainability" has been crucial in transforming New York City into a luxury, exclusive, and excluding city: private investments in urban green spaces attracted affluent populations and raised property values; (b) *industrial gentrification* concerns the spatial distribution of industrial sites, historically complementary to green spaces localization in order to protect property value; the history of NYC's industrial gentrification is intertwined with the city's economic and planning development, including zoning reforms, peripheralization of manufacturing zones to make room

4 The concept of sustainability fix is defined "as a sociospatial compromise between economic interests and environmental claims whose main function is to 'safeguard growth trajectories'" (Scanu *et al.*, 2021, p. 1371). There is a vast literature on sustainable fix that we do not address here, see e.g. Long, 2016; Scanu *et al.*, 2021; Temenos & McCann, 2012; While *et al.*, 2004.

in central areas for businesses, financial offices, and luxury housing, processes of displacement and segregation of low-income residents, shrinking of services following neoliberal austerity "mantra", development of small "eco-friendly" businesses better suited to meet the preferences of affluent green consumers; c) *brown gentrification*: reclamation programs of toxic properties and brownfields, based on private investment, mainly in neighborhoods where property values were set to rise. The apparent consistency of these programs with environmental justice movements' claims that call for intervention to reduce the environmental burdens faced by communities of color; the acknowledged role of the market and private investment, however, means that interventions are concentrated in neighborhoods where property values are rising, widening the gap with "depressed" neighborhoods lacking the tools for remediation.

Similar trends can also be found in the European case, although often less "violent". In Leipzig, Annegret Haase (2019) focuses on how greening can create exclusionary dynamics when embedded within capitalist logics of housing markets. A park established at the end of the 1990s, during a phase of strong urban shrinkage (Großmann *et al.*, 2013; Martinez-Fernandez *et al.*, 2012), to create a green space available to residents and "keep" them in the neighborhood, becomes – during the city's sudden regrowth after 2010 – a catalyst for regeneration processes, real estate investment and transformation of the demographic, social and residential structure of the neighborhood's population, with the risk for poorer residents to be displaced elsewhere.

Although not all urban greening initiatives create gentrification (Eckerd, 2011), gentrification can be a driver of the development of such projects, while in other cases, it is the green redevelopment interventions triggering gentrification processes (Carrosio & Landi, 2023). Research focuses primarily on this second dynamic, but the two processes often overlap. However, the outcome is the same: wealthier, better-educated people and more powerful groups tend to have greater access to greener and more valuable neighborhoods, while long-term residents of lower incomes face an increase in the value of ownership of such areas (which, depending on the context, translates into an increase in rental prices, property taxes or maintenance costs) (Anguelovski *et al.,* 2019; Cucca, 2020).

4. Investigating the urban fabric for a contextual design of urban policies: the case of the Boston Area Research Initiative

The theoretical focus on the social and spatial structure of the city and the inequalities within it needs adequate methodological tools. Research on environmental justice, vulnerability, and climate change has made wide use of the classic sociology toolbox, using both quantitative (census, official statistics, surveys) and qualitative (interviews, participant observation, newspapers, archives, etc.) data, sometimes integrated with GIS techniques of mapping and spatial analysis.

Recent technological development has led to the explosion in technological capacity for data production, collection, and processing, together with the diffusion of a large number of internet-connected devices equipped with sensors of various kinds collecting data on – for instance – environmental conditions (temperature, light, sound, ...), location (GPS coordinates, movement, ...), and individual health conditions (heartbeat detection sensors, ...) (Swan, 2012). The so-called Big Data challenges the «predominant authority of sociologists and social scientists more generally to define the nature of social knowledge», bringing «different modes of addressing the public, mobilizing expertise, conceptualizing the social, and research methodology» (Burrows & Savage, 2014, p. 5).

In environmental justice studies, the innovation of low-cost monitoring devices has opened new research possibilities. Already characterized, as previously demonstrated, by a certain contiguity between activists and researchers, the environmental justice movement has benefited and evolved around the possibility of having these devices. This technological advancement has fu-

eled a new impetus to citizen science, resulting in science-led or citizen-led projects that create new opportunities for cooperation between academics, activists, and citizens. From a scientific perspective, «citizen science is particularly effective at addressing ecological questions at large spatial and temporal scales that cannot be covered by a small team of investigators. By tracking ecosystems over time, citizen science can provide crucial baseline information on effects of global change and for identifying locations with both good and poor environmental health» (Adler *et al.,* 2020, p. 53). Voluntary modes of citizen participation in environmental justice citizen science research are, for example, citizen sensing, with citizens becoming "monitoring terminals" dispersed throughout the territory of interest (e.g., Johnston *et al.,* 2020; Racz & Rish, 2022), or participatory mapping, with digital mapping technologies used to collect, amplify and represent the needs of the most marginalized communities, developing a more egalitarian system of knowledge production, with equal dignity accorded to citizen knowledge and researchers' scientific expertise (e.g., Connors *et al.,* 2012; Haklay & Francis, 2017).

Big Data, unique in "holding together" features of *volume*, *velocity*, *variety*, *exhaustivity*, fine graining in *resolution*, *relationality,* and *flexibility* (Kitchin, 2013) with generally affordable costs, have seen a rapid increase in diffusion and use in social research. Moreover, because much of these data contains geographic attributes, they represent an extraordinary tool for spatial research, suitable for analysis conducted on different spatial levels (*ibidem*). From this article's perspective, it is worth emphasizing how these new tools offer new possibilities for empirical research at the micro-urban scale, crucial in the field of environmental and climate justice, for example, in the analysis of social inequalities related to spatial patterns of individuals and community vulnerability to natural hazards, and displacement processes related to the impacts of disasters or driven by urban sustainability policies.

As many have emphasized, Big Data should be seen as complementary to the "small data" produced by more traditional methodologies, creating new opportunities for empirical research on new and "old" issues (Gray *et al.,* 2015; Kitchin, 2013, 2014; Kitchin & Lauriault, 2015; Kontokosta & Malik, 2018; O'Brien, 2016). An innovative form of Big Data integration with "classical" ones can be seen in the "ecometrics" approach (O'Brien *et al.,* 2015; Raudenbush & Sampson, 1999). "Ecometrics" represents a systematic approach developed to measure the socio-ecological features of a neighborhood. The idea implicated is that neighborhood phenomena need specific measures, not based on individual or aggregated data (such as census data). From a methodological perspective, ecometrics can be combined with Smart City technological tools, contributing to a holistic environmental and social sustainability approach.

A brilliant example of integration between data produced from traditional empirical methods, "ecometrics", big data, and administrative data is the experience of the Boston Area Research Initiative (BARI). BARI is an inter-university research center developed by Northeastern University, Harvard University, and the City of Boston. Academics, policymakers, community members, foundations, and corporations work together on research projects addressing a variety of crucial urban issues such as custodianship in the urban commons (O'Brien *et al.,* 2015), segregation and mobility (Wang *et al.*, 2018), microspatial inequalities connected to heat and air pollution in the city, and the different geography of these two hazards (O'Brien & Mueller, 2023). Moreover, these issues are studied innovatively, integrating big data (data from 311 and 911 calls, data mining from social networking platforms, satellite data, mobile phone GPS data) and data produced by traditional methods or administrative data.

In particular, the opportunities big data can bring to understand better environmental and climate injustice and the fight against them are well documented in studies published in the last few years (O'Brien *et al.*, 2020; O'Brien & Mueller, 2023). Moving from the understanding that exposure to environmental hazard vary across neighborhoods and communities, the Authors focus on *microspatial inequalities*, specifically at the level of Boston streets, to evaluate extreme heat and air pollution distribution. This perspective is to overcome some limitations of neighborhood-level analyses, given that some crucial factors for environmental hazards (such as pave-

ment density, trees, reflective surfaces, and building heights) not only differentiate neighborhoods but also streets within neighborhoods and even street segments along the same street, with different outcomes on public health. Using remote sensing data on land surface temperature (from Landsat) and other associated factors such as surface reflectivity, canopy and impervious surface cover, scholars were able to map the spatial distribution of extreme heat hazard, identifying so-called "urban heat islets" (O'Brien *et al.*, 2020) crucial to explain health outcomes detected during heat advisory days.

In relation to air pollution, cellphone mobility data is utilized to estimate vehicle emissions at the road scale, and these estimates are combined with data on the urban canyon effect, describing local air flows that can trap vehicle emissions. This information is derived from data on the built environment, including the average height of buildings for each street and the street width, enabling a classification of each street's risk level for the city. This approach offers several benefits, providing an accurate understanding of environmental inequalities and spatial distribution, considering the diverse nature of urban areas that may vary significantly even at the neighborhood level. Furthermore, it has significant implications for urban adaptation and mitigation policies concerning climate change, as it helps guide investments and interventions towards areas with higher risk to mitigate exposure or prevent local effects during heatwaves.

Finally, BARI demonstrates both the importance of a "micro-scale" understanding of inequalities, especially in terms of distributive justice, made easier by Big Data, and the value of collaborative, interdisciplinary research for understanding and addressing complex urban problems. Its work serves as a model for other research centers seeking to engage with communities and policymakers to produce research with "real-world", public implications. In addition, the hope is that tools such as the one briefly described, focused on the issue of urban inequalities, will help affirm the need to design contextual policies able to capture the inequalities within a city and its neighborhoods in a "place-based" approach that recognizes and enhances the contextual distinctiveness in policies, departing from a one-size-fits-all, "unjust", approach.

Final remarks

To understand cities as spaces *where climate change happens* implies examining preexisting inequalities and other "classical" topics for urban sociologists. Environmental issues have always been part of this story, representing one of the many stressors of urban conflicts and segregation processes. However, in the climate change scenario, the urgency for research and interventions to focus on the distribution of hazards along race, class and gender axes and its spatial dimension is magnified.

The article focused on this last matter, with par. 1 exploring how environmental justice, from its very beginning, adopted an explicitly spatial approach to environmental issues. Facilities such as waste disposal sites and polluting industrial installations become politically "problematic" precisely because of their location and the top-down procedure determining it, opposed by local communities. Par. 2 focused explicitly on climate justice, driven by the idea that the risks associated with climate change are not experienced the same for everyone. Inequalities in exposure, sensitivity, and capacity to adapt to climate change underline how cities' environmental challenges in the coming climate-changing scenario are still spatially unevenly distributed. Par. 3 argues that big data (whether produced by citizens, sensors, or apps) can play an essential role in today's environmental and climate justice studies, expanding opportunities for scholars, activists, and policymakers' efforts: from a spatial perspective, for instance, by allowing a better understanding of micro-inequalities. We described the Boston Area Research Initiative experience as an exciting example of this opportunity, being at the same time a virtuous example of inter-institutional collaboration, able to engage with local communities and their needs.

The public's attention today on the impacts of climate change and the need for a just transition, the increasing relevance of environmental issues within urban policies, together with the increased availability of relatively cheap technologies make new room for climate justice scholars and activists. The opportunity to collect massive amounts of digestible data on the environmental features of our cities represents a crucial innovation for urban policies, informing policymakers' decisions and activists'. In this context we would like to stress the need for a robust spatial analysis rooted in environmental justice history- with its legacy not being overshadowed but vehemently reaffirmed.

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SEZIONI A 3T

LETTURE A 3T

Francesca Bria, *Evgeny Morozov, Ripensare la Smart City, Codice Edizioni, 2018*

Francesca Bria e Evgeny Morozov esortano a ripensare la smart city. Ne abbiamo bisogno? Eppure la narrazione dominante sembra restituire l'idea di un ecosistema finalmente ordinato, verde e sostenibile dove la tecnologia riesce a superare quei problemi urbani a cui la scienza sociale e la politica non sono riuscite a dare risposte convincenti. Problemi di criminalità, sporcizia, burocrazia e naturalmente le più svariate forme di disuguaglianze, dal reddito alla salute. In effetti, sempre più spesso negli ultimi anni si sente parlare di tecnologie smart applicate al governo della città: sensori in grado di regolare il traffico, cestini dei rifiuti che segnalano autonomamente quando essere svuotati, algoritmi talmente intelligenti da prevedere i crimini. La promessa delle città smart di gestione urbana attraverso la tecnologia si basa in ultima istanza sulla raccolta costante e ininterrotta di dati. Tali dati vengono raccolti da sensori diffusi nello spazio pubblico, ma anche dalle applicazioni che utilizziamo nei nostri smartphone, dai siti che visitiamo, dalle nostre attività sui social networks, e così via. Un'enorme quantità di dati che viene poi rielaborata da potenti computer per trasformarsi in azioni. Nel caso delle smart cities in azioni finalizzate ad offrire servizi. Il lavoro "Ripensare la smart city", di Francesca Bria e Evgeny Morozov si occupa proprio di mettere ordine in questo intricatissimo intreccio, andando però oltre. In effetti, la promessa tecnologica di poter risolvere tutti i problemi della città nasconde molte criticità che gli autori mirano a far emergere; e lo fanno inquadrando la questione tecnologica nel contesto più ampio economico e politico, facendo dialogare il livello locale con quello globale. Il problema, suggeriscono gli autori, non è applicare la tecnologia alla governance urbana, ma appaltare quest'ultima ad attori privati. In effetti, si chiede Morozov, come si può parlare ancora di "diritto alla città" (Lefebvre, 2013) quando diritti come la salute, una dimora dignitosa in cui vivere o la mobilità e le infrastrutture che li garantiscono diventano servizi gestiti da attori privati per clienti che possono permetterselo? O ancora, se la sicurezza della città viene subappaltata ad algoritmi intelligenti controllati dalle multinazionali?

La città come spazio aperto, come arena dove si incontrano e scontrano diverse visioni del mondo viene messa in discussione dalla crescente privatizzazione dello spazio pubblico già da tempo. Privatizzarne la governance attraverso la privatizzazione di asset strategici e fondamentali, come sicurezza, trasporti o sanità è un passo ulteriore.

Gli autori, in questo lavoro, dimostrano come il meccanismo che guida le città verso tale scelta è una via quasi obbligata. Infatti, nella cornice neoliberista del mondo che viviamo, con la crescente austerità che colpisce le amministrazioni pubbliche locali, con sempre meno fondi e sempre più problemi da affrontare le soluzioni messe a disposizioni dalle grandi aziende dell'hi-tech finiscono per essere troppo allettanti per essere rifiutate. Esternalizzare il trasporto pubblico ad aziende come Uber permette di abbattere i costi per gli utenti, aumentare il servizio di mobilità nel territorio urbano e contenere i costi per la pubblica amministrazione. Nell'immediato, per il decisore politico, i vantaggi sono indiscutibili: offrire maggiori servizi, senza mettere a rischio le casse comunali. Probabilmente sarebbe anche difficile per un'amministrazione locale giustificare ai cittadini un'opposizione all'offerta di migliorare i servizi urbani come la mobilità, dal momento che l'alternativa è la riduzione della spesa pubblica causata da sempre meno fondi pubblici disponibili. Nel libro tale tendenza acquisisce una sua definizione: "keynesianesimo privatizzato". Il sistema di welfare, che ha garantito nell'ultimo secolo lo stile di vita che ha plasmato le nostre società attraverso sanità, fondi pensionistici, trasporti, istruzione e sicurezza gestiti dallo Stato viene ora appaltato ai privati; i quali, come è ovvio, mirano al profitto.

Il complesso quadro che gli autori disegnano è quello di un contesto neoliberista globale in cui alle città viene richiesta austerità e contemporaneamente offerta la possibilità di esternalizzare i servizi, privatizzando progressivamente pezzi chiave della governance pubblica.

Al cuore di questo processo vi sono i dati. Nell'economia digitalizzata contemporanea l'enorme mole di dati che vengono raccolti quotidianamente diventa una risorsa fondamentale, finanche una merce da poter scambiare, poiché sulla loro elaborazione si basa la tecnologia di cui si parla.

Dunque, sempre di più diventa fondamentale detenere la proprietà dei dati raccolti. E per il momento questa è nelle mani delle multinazionali.
Opporsi a quest'economia, si dice nel libro, diventa sempre più difficile per l'amministrazione cittadina. Dunque non si tratta semplicemente di opporsi alla richiesta di privatizzazione dei servizi delle multinazionali. Il livello locale è condizionato e fortemente intrecciato con quello globale: le organizzazioni sovra-nazionali come le Banche Centrali o le agenzie di rating, organismi che non vengono eletti e che quindi non devono rendere conto all'opinione pubblica, attraverso indici e classifiche decidono la reputazione e l'affidabilità internazionale di Stati e Città. In un sistema in cui la finanza ha sostituito l'economia essere appetibili sui mercati diventa questione di sopravvivenza per gli attori pubblici, perché da tale posizionamento vengono decisi i fondi e gli investimenti che poi le amministrazioni ricevono.
Il quadro appare desolante, ma esistono delle strategie di resistenza per essere delle "città ribelli" (Harvey, 2013), e nel libro ne vengono elencate diverse. Il punto centrale non è rinunciare alla tecnologia, ma puntare a una sovranità digitale e iniziare a pensare ai dati come beni comuni, costruire tutele per opporsi alla loro privatizzazione e porre un freno alla commercializzazione. I dati devono essere considerati alla stregua di altri beni considerati strategici, come l'energia, la salute, ecc. e quindi non privatizzabili.
Sostengono gli autori, non vi può essere un diritto alla città senza sovranità digitale, dal momento che sempre più la tecnologia permea ogni aspetto della gestione urbana.
Questo libro, quindi, attraverso l'enorme lavoro di raccolta di esperienze "ribelli" in giro per il mondo e la capacità di trattare un argomento complesso in modo accessibile, districando i nodi che legano i livelli locale e globale e pubblico e privato; potrebbe essere inteso come un manuale per invertire il processo di privatizzazione dello spazio materiale e virtuale urbano. Per questo, si potrebbe dire che la sua forza è nell'essere un lavoro di divulgazione che raggiunge facilmente diversi pubblici, la sua versatilità ne fa uno strumento utile non solo per gli appassionati che intendono chiarirsi sul complesso rapporto tra tecnologia e governance urbana, ma anche per coloro che studiano tali dinamiche dal punto di vista delle scienze sociali; e soprattutto diviene imprescindibile per politici e amministratori pubblici, nel tentativo quantomeno di avere una visione alternativa a quello che sembra l'unico sistema di governance possibile.

Francesco Calicchia

Maurizio Carta. Città aumentate. Dieci gesti-barriera per il futuro, Il Margine, 2021

Maurizio Carta, professore ordinario di Urbanistica e Pianificazione territoriale, nel suo recente volume analizza con un piglio analitico e critico la città post-covid proponendo al lettore dieci proposte concettuali e operative per rendere le città grandi e piccole, che siano pronte, a rispondere alla crisi dell'Antropocene dopo la pandemia da Covid-19. Il volume, infatti, è stato scritto in un contesto storico e sociale recente, quella pandemia globale, che ha fatto vivere alla nostra società oltre che una crisi sanitaria, anche, una crisi ambientale ed economica aggiungendo alle patologie ormai radicate della nostra città (povertà, disuguaglianze, emarginazione, degrado ambientale) altre patologie come il cambiamento climatico, l'ingiustizia sociale, la frammentazione dello spazio urbano, l'inefficacia della salute pubblica e i divari educativi. In questo scenario, così complesso Carta, introduce un nuovo paradigma urbano quella della "città aumentata". Più specificamente, spiega l'autore, che c'è la necessità di un passaggio dall'Antropocene alla Neoantropocene progettando i futuri urbani con il «pensiero delle cattedrali» (p. 18) ossia pensando di gettare le fondamenta di una cattedrale ma proiettandoci verso un futuro lungimirante per le prossime generazioni e compiendo azioni quotidiane, specifiche, individuali e collettive che realizzino questo tipo di città. L'autore, difatti, ci parla di quello che definisce futuredesign, vale a dire la necessità di tornare a progettare un futuro che sia sostenibile per il nostro pianeta andando a modificare comportamenti, azioni, relazioni e liberandoci da un passato anestetico sfuggendo perfino ad un presente tossico.
Ritornando al paradigma della "città aumentata" - per indicare un necessario salto di paradigma urbano - l'autore, di conseguenza, ci propone in questo testo quali possono essere le dieci azioni per reinventare la città e la comunità. «La città aumentata parte dalla città esistente per incrementarne le qualità e le capacità di rispondere alle esigenze degli abitanti, proponendosi come dispositivo spaziale (essa è innanzitutto uno spazio che noi plasmiamo per viverci) in grado di agire contemporaneamente nelle dimensioni culturale, sociale, economica ed ecologica per migliorare la nostra vita, individuale e collettiva, informale e istituzionale, amplificando lo spazio urbano generato dagli effetti dell'innovazione» (p. 37). In sintesi, tale paradigma nasce dall'esigenza di migliorare le nostre città e di ridefinire i dogmi dell'urbanistica ancora troppo statici e basati su regole e norme che non tengono conto dell'aspetto reattivo e creativo. La città aumentata, a tal proposito, è uno spazio per migliorare la qualità della vita delle persone e per proporre uno sviluppo economico equo e sostenibile e una qualità del territorio che rinforzi la sua sicurezza ma, più che altro, che metta al centro i bisogni della comunità.
Dieci sono, pertanto, i gesti-barriera della città aumentata che circoscrivono concetti, strumenti e pratiche per le città che vogliono definire i loro futuri: il primo gesto quello di essere più senziente per percepire in tempo reale i problemi degli abitanti e dell'ambiente e per fornire risposte tempestive; il secondo quello di essere una città più aperta e collaborativa attraverso un patto tra la dimensione civica e quella tecnologica; il terzo che riguarda l'intelligenza artificiale e che, secondo l'autore, deve essere accoppiata a quella umana dando risposte efficaci alle diverse esigenze della comunità; l'altro gesto osserva la rilocalizzazione delle imprese, della manifattura tradizionale, degli artigiani digitali all'interno di distretti urbani creativi e produttivi per ricostruire l'economia di una città. Rispetto alla creazione di distretti creatività, l'autore si sofferma dunque sulla creatività come quinto gesto utile per agevolare l'uso della cultura, della comunicazione e della cooperazione. La città aumentata deve anche attuare un gesto di riciclo attraverso forme di bricolage urbanistico, nonché, attuare una resilienza che agisce per progettare città che si adeguino costantemente all'ambiente e ai bisogni della comunità. Un ulteriore gesto riesamina le città aumentate costiere, lacustri e fluviali che necessitano di riconquistare l'acqua come fattore di prosperità, di bellezza e di nuovo spazio collettivo. Il nono gesto, invece, incoraggia la città aumentata a procedere con decisione e coraggio verso la reticolarità del loro

impianto urbano, assumendo un chiaro policentrismo come orizzonte del loro futuro. Infine, l'ultimo gesto-barriera è quello di essere strategici nelle decisioni e nelle azioni, in particolare, in quelle che riguardano le nuove pratiche di rigenerazione urbana adottando «un approccio incrementale e adattivo che agisca per fasi creative, collaborative e di sviluppo, attuate e valutate nel breve, medio e lungo termine» (p. 51).
Tali gesti devono poi concretizzarsi, secondo Carta, in azioni concrete di miglioramento per la creazione di un'agenda urbana e di politiche urbane efficaci e indispensabili anche alla luce del Next Generation EU e del nuovo Piano di ripresa e resilienza.
I capitoli del volume, per questa ragione, illustrano e chiariscono dettagliatamente i dieci gesti-barriera che hanno - come chiarisce l'autore - un valore universale potendo e dovendo essere adottati da tutte le città per entrare in quella fase del Neoantropocene, in particolare divengono gesti prioritari per le città italiane. Tali gesti sono, inoltre, riletti in un'ottica di impegno politico e culturale soprattutto per il futuro delle città italiane.
Recuperando concetti familiari e chiari, per chi si occupa di pianificazione territoriale e urbanistica, Maurizio Carta tenta di compiere nel suo volume quel passo in avanti per fornire al lettore una chiave di lettura chiara e concreta su quali possano essere, appunto, le azioni in grado di rimodellare la città e il nostro Paese attraverso un rinnovato paradigma urbano.
Interessante è il discorso intorno al processo di rigenerazione urbana. Tale processo riguarda il ripristino della sua urbanità, cioè quella qualità della vita urbana e quelle relazioni sociali che definiscono la città in quanto entità fisica, sociale e coesa. Secondo questa definizione, la rigenerazione della città non può avvenire senza azioni e politiche che non riconoscono i diritti di base di tutti i cittadini e non soddisfino i bisogni fondamentali di quest'ultimi come il lavoro, l'educazione, la salute, la partecipazione alla sfera pubblica, l'abitazione e il riconoscimento delle diverse identità culturali tanto che, ad oggi, anche le questioni sociali diventano per definizione al centro delle politiche di rigenerazione urbana. Le questioni critiche, però, della rigenerazione urbana gerarchica non possono essere risolte solo rivedendo le procedure di partecipazione poiché occorre ribaltare la visione. Secondo l'autore, c'è la necessità di rifiutare il tradizionale approccio top down per adottare un nuovo approccio incrementale, flessibile ma che non ceda neppure alle retoriche consolatorie del bottom-up. Una rigenerazione urbana efficace deve rifiutare la dialettica conflittuale tra regolazione top-down e pratiche bottom-up agendo come un protocollo circolare di relazioni tra diverse scale e soggetti, stimolando un ambiente efficace di sussidiarietà intelligente.
La città aumentata, quindi, non chiede solo un'efficace strategia di pianificazione o un'innovazione delle politiche urbane ma reclama politiche e azioni che sconvolgano positivamente gli organismi urbani, inoltre, questa città deve vivere la dimensione della "molteplicità", come è descritta da Italo Calvino nelle sue Lezioni americane: «oggi non è più pensabile una totalità che non sia potenziale, congetturale, plurima. I libri moderni [per me le città] che più amiamo nascono dal confluire e scontrarsi d'una molteplicità di metodi interpretativi, modi di pensare, stili di espressione. Anche se il disegno generale è stato minuziosamente progettato, ciò che conta non è il suo chiudersi in una figura armoniosa, ma è la forza centrifuga che da esso si sprigiona, la pluralità di linguaggi come garanzia di una varietà non parziale» (p. 266).

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La Smart City e la Città Comoda. Una Nuova realtà futurista "smartiana" a cura di Giulia Agrosì

"La Smart City e la Città Comoda. Una nuova realtà futurista", pubblicato nel 2022 dall'architetto Giulia Agrosì, è un libro di carattere tecnico-scientifico che affronta una delle cruciali sfide attuali con profonde implicazioni urbane: il processo di digitalizzazione per potenziare i servizi cittadini, in conformità con i principi guida della sostenibilità. Il libro evidenzia un importante sforzo definitorio del concetto di smart city, esplorando approfonditamente aspetti e fattori abilitanti, oltre ad offrire soluzioni praticabili per affrontare la sfida della transizione digitale ed ecologica di questi anni.

Il libro è suddiviso in quattro parti, ciascuna delle quali raccoglie i contributi di esperti in diversi campi disciplinari: La Città del Futuro (Agrosì; Mercatili, Giordano, Ricchio; Zilli); La Progettazione Intelligente (Trasi; de Caro, Balbi, D'Eredità); Cibo Intelligente e Microclima (Rossi; Georgiadis); Normativa e PNRR (Agrosì; Varricchio; Zanin).

Nell'introduzione, Agrosì anticipa il contributo del libro nell'organizzare il vasto corpus teorico e le applicazioni pratiche dei modelli di città intelligenti previsti per il prossimo futuro. Un primo passo in questa direzione consiste nella definizione di Smart City, considerando le rapide e intricate dinamiche economiche, sociali, culturali e ambientali che caratterizzano questi anni.

Rispetto alle concezioni di smart city presenti in letteratura, che spesso enfatizzano il potenziale delle infrastrutture tecnologiche e il loro impatto sulle città, Agrosì sottolinea l'importanza di analizzare il concetto tenendo conto della sua natura multiforme e poliedrica.

In questo senso, il termine "smart" comprende una serie di fattori abilitanti che integrano la pianificazione urbana, al fine di creare una città più connessa digitalmente, compatta ed efficiente nella fornitura e nella gestione di servizi, e inclusiva dal punto di vista sociale ed economico. In sintesi, "intelligente" è una città che ha digitalizzato gran parte, se non interamente, dei suoi servizi cittadini, ha adottato una gestione responsabile delle risorse naturali sempre più scarse, promuove modelli di economia circolare, ridefinisce soluzioni di mobilità sostenibile per ridurre le emissioni di CO2, lotta contro il degrado, la marginalità sociale e, più in generale, lavora per migliorare la qualità della vita nelle aree urbane.

I contributi raccolti nella sezione Città del Futuro approfondiscono questi temi a partire dalla dimensione urbana. L'insieme di edifici, di spazi e delle espressioni di socialità che vi prendono forma, sono al centro dell'urbanistica da secoli: «la responsabilità del progettista di creare la "città comoda" è stato sempre l'obiettivo habitat antropologico primario, attraverso il quale la rivisitazione degli spazi in modalità ergonomica ed economica creano la quarta dimensione e lo strumento di azione per rendere tutto efficiente, efficace e sostenibile» (p. 38).

Oggi questi principi ispiratori della pianificazione urbana sono ancora più cruciali, poiché le città del futuro devono essere in grado di promuovere una convergenza sistemica, equilibrata tra sistemi fisici, naturali, tecnologici e societari. Inoltre, viene sottolineato che la progettazione di una smart city deve tener conto della differenza tra città vergine che per sua natura è nativa digitale e città esistente che richiede un'ottimizzazione digitale. La vera sfida consiste nel trasformare la città esistente – caratterizzata da un suo vissuto storico e urbano frutto dalla stratificazione dei popoli nel tempo – in una smart city. Ulteriori sfide emergono dalla rapida accelerazione digitale, in gran parte catalizzata dalla pandemia da Covid-19, che ha influenzato i nostri modi di lavorare, consumare e socializzare. Al contempo, le città sono coinvolte in un processo di urbanizzazione senza precedenti, con una crescente domanda di abitazioni, di spazi per il tempo libero, di infrastrutture e trasporti in grado di soddisfare le esigenze di una varietà di city users. In questo contesto in rapida evoluzione, è fondamentale dotarsi di strumenti aperti e flessibili per rispondere ad una vasta gamma di bi-sogni "corti". Le riflessioni degli autori sintetizzate in queste righe sono ricondotte a diversi indirizzi di sviluppo delle città, sostenute dalle tecnologie digitali già a disposizione. In particolare, le tecnologie IoT (Internet of Things) stanno modificando il modo

di vivere e di amministrare le città, conferendo una importante centralità al dato. La coproduzione di dati e informazioni da parte degli utenti e delle amministrazioni locali, l'acquisizione e l'analisi possono migliorare in maniera intelligente e con costi contenuti numerosi aspetti della vita urbana, tra cui la viabilità, l'illuminazione pubblica, la gestione delle risorse e dei rifiuti, gli edifici e i processi produttivi. In definitiva, gli autori concordano sul fatto che la smart city evoca l'immagine di una città del futuro in cui la tecnologia digitale è un mezzo al servizio dell'uomo per migliorare la vivibilità, oltre ad essere un fattore abilitante di rilievo per lo sviluppo sostenibile dei territori. Così intesa, la smart city non è solo un artefatto urbano-digitale del futuro, ma è la cifra di processi, procedure e pratiche altamente intelligenti. Pertanto, lo scopo prioritario del nostro tempo è intervenire nel complesso morfologico e sociale esistente attraverso una Progettazione Intelligente. Argomento della seconda sezione del libro, le città attuali sono descritte come un nodo cruciale della questione ambientale ed energetica. Edifici energivori, trasporti impattanti e abitudini di mobilità inefficienti, produzione industriale in continua crescita, solo per citarne alcuni, sono tutti fattori che contribuiscono all'emissione di inquinanti causando l'effetto isole di calore. In linea con le raccomandazioni europee, le città devono prefiggersi di ridurre drasticamente le emissioni entro il 2050. Un simile risultato è conseguibile con interventi mirati in campo di mobilità e con l'adozione di strategie innovative di progettazione urbana per migliorare l'efficienza energetica degli edifici, le nuove costruzioni e gli spazi nei quartieri, tra cui gli spazi verdi e il recupero di aree dismesse. Alla base del rinnovato modello di progettazione delle città, le metodologie a supporto del settore delle costruzioni presentano un vasto potenziale. Tra questi vi è il BIM (Building Information Modeling), un modello virtuale che consente di costruire, gestire e monitorare l'intero ciclo di vita di un edificio nel rispetto dell'ambiente. Tra i punti di forza del modello vi è la possibilità di unificare informazioni e dati di carattere tecnico in un ambiente multiprofessionale (interoperabilità), e la possibilità di produrre un digital twin per eseguire test su un analogo digitale, riducendo potenziali errori sull'oggetto reale.

Su questa spinta innovativa il costruito rappresenta una chiave di volta per rispondere ai bisogni ambientali e sociali. Gli spazi cittadini, i diversi piani e i tetti degli edifici diventano anche luoghi potenziali per la produzione di una parte di cibo che arriva sulle nostre tavole. Il Cibo intelligente e il microclima, il tema della terza sezione del libro, raffigurano un'alternativa possibile per rispondere al cambiamento climatico in atto, rendere più sostenibile l'accesso al cibo e promuovere senso di comunità e condivisione tra i cittadini. Da un punto di vista ambientale, questo tipo di produzione domestica offre il vantaggio di ridurre il consumo di suolo, ri-utilizzare i materiali di scarto, ridimensionare i costi di importazione delle materie prime, salvaguardare la biodiversità. Da una dimensione sociale, le soluzioni basate sulla natura (NBS) favoriscono stili di vita più sani e partecipativi, insieme ad opportunità di guadagno con la vendita del surplus prodotto. Dunque, le ricette verdi così immaginate e realizzate potranno contribuire, al pari di altri interventi, alla transizione ecologica di molti centri urbani.

Se è chiaro che diversi fattori abilitanti possono effettivamente supportare il progetto di una smart city, meno evidenti sono i meccanismi istituzionali che orientano le politiche in questa direzione. La quarta sezione, Normativa e PNRR, evidenzia la mancanza di una definizione di smart city nella normativa sia europea che italiana. Questi confini giuridici del tutto incerti influiscono anche sui modelli di governance, con la smart city spesso interpreta come un approccio di soft law. Tuttavia, gli indirizzi europei e nazionali rimarcano, da un lato, l'esigenza di incentivare un maggiore coinvolgimento delle autorità locali per differenziare i bisogni dei singoli territori, e dall'altro di superare le politiche settoriali nell'elaborazione di strategie di smart city. In aggiunto a ciò, si stanno sostantivando una serie di investimenti per la realizzazione di infrastrutture digitali, grazie alle quali le smart city troveranno un concreto terreno di applicazione. Nel contesto italiano, il Piano Nazionale di Ripresa e Resilienza (PNRR) destina il 27% delle risorse proprio alla transizione digitale (p. 234). L'obiettivo è creare un'adeguata infrastruttura digitale che fornisca le basi necessarie per sostenere il percorso di modernizzazione del Paese sul piano tecnologico, ambientale, economico e sociale.

La Smart City e La città Comoda si propone come un testo estremamente attuale, impegnato nel confronto con le sfide contemporanee e nel delineare una serie di orientamenti strategici per realizzare l'ambizioso progetto di città intelligenti, inclusive e sostenibili. Il libro costituisce un contributo di rilievo alla letteratura scientifica sul tema delle smart city, poiché offre un quadro esaustivo della situazione attuale e approfondisce le implicazioni a livello di città, ambiente, pianificazione, qualità della vita e governance. La raccolta di contributi che adottano differenti prospettive disciplinari aggiunge un valore distintivo e favorisce quel dialogo interdisciplinare essenziale non solo per comprendere la complessità delle dinamiche urbane e sociali, ma anche per gestirle efficacemente.
Il libro si rivolge a un pubblico diversificato che può comprendere ricercatori, studenti universitari e professionisti attivamente coinvolti nella pianificazione e progettazione urbana. Inoltre, è destinato ad attrarre anche l'attenzione di figure politiche interessate a promuovere lo sviluppo delle città del futuro.

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INCONTRO FUORI LUOGO

Senzio Sergio D'Agata[1]

Smart Cities, Green Urban Growth and Sustainable Development: a Socio-Cybernetic Reading in conversation with Mark Deakin

Mark Deakin is a professor at the School of Computing, Engineering and the Built Environment, Edinburgh Napier University, UK. He is a leading scholar in the field of smart cities and sustainable development and his longstanding research activity has contributed to the development of an understanding of smart cities able to grapple with the complexity of the issue. Moreover, Mark Deakin has directed several research projects dealing with Smart Cities and the Sustainable Development of Urban Environments for the European Commission, Economic and Social Research Council, and Engineering and Physical Sciences Research Council in the UK.
In this interview, the professor gives us a general understanding of the smart cities agenda, highlighting the potential of a socio-cybernetic approach in which humans stand as protagonists with the assistance of technologies brought to the fore by research and innovation strategies.

Question 1 - As I write, Southern Europe is hit by one of the worst heat waves ever recorded, with severe consequences for many urban contexts. While our cities' development path needs to change, we struggle to find a convincing alternative. The concept of the smart city often goes together with the sustainability one, presented as a powerful and promising way to achieve the goals of sustainable development. However, scholars all around the world, spreading from critical theorists to neoliberal intellectuals, continue to debate the true meaning of sustainability struggling to find a common ground. In this broad and different scenario, what are the main contributions that a smart city transition theory can offer?
Answer - As the United Nations' (UN) 2015 Sustainable Development Goals (SDGs) and 2016 HABITAT III Urban Agenda (UA) make clear, the challenge cities around the world now face is no longer solely humanitarian but also social. No longer solely humanitarian, but also social in the sense the SDGs of the UA stand as attempts to explore the relationship between the humanity of wealth creation and the prosperity of society. This is something they achieve by exposing the adverse effect any division between them (human wealth creation and social prosperity) has on the health and well-being of cities around the world.
The onset of global warming and climate change no doubt offers the strongest example of where divisions between the humanity of wealth creation and prosperity of society adversely affect the health and well-being of cities. No doubt because the exploitation of nature, depletion of resources and emission of carbon into the atmosphere, causes global warming to reach that level which cities no longer consider safe. Cities no longer consider safe but on the contrary so insecure for the UN and HABITAT III to begin questioning whether the urban growth model available for humanity to create wealth and society to prosper is still fit for purpose. Is still fit for purpose, not because urban growth fails on humanitarian grounds alone but for the reason wealth creation also falls short as the social basis of prosperity. Fails and falls short on these grounds and this basis, due to the model of urban growth cities around the world stand by for humanity to create wealth and society to prosper being neither environmentally just nor fair. Neither environmentally just nor fair in terms of that human wealth creation, social prosperity, health and well-being which cities around the world either stand tall against or fall on. Either stand tall against or fall on as the human wealth creation, social prosperity, health and well-being of that quality-of-life which cities provide access to all around the world and both the UN and HABITAT III expect regions to sustain the development of.
The challenge of humanity creating the wealth needed and society prospering from that urban growth which is able to close any gap between them, vis-à-vis be environmentally just and fair in creating wealth and prospering from the health and well-being this generates is now given

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to smart cities. These cities are charged with the responsibility of turning the injustices and unfairness of the current situation around by getting smart about urban growth. Getting smart about urban growth by turning humanitarian failures into successes and social shortfalls into longstanding fulfilments. Into successes and longstanding fulfilments able to turn the fortunes of cities all over the world around. Turn the fortunes of cities all over the world around by virtue of modelling the humanitarian grounds and social basis of urban growth as environmentally just and fair. Environmentally just and fair in the sense the humanitarian grounds for and social basis of the wealth creation, prosperity, health and well-being smart cities safeguard is drawn from that process of climate change adaptation which secures the potential the so-called fourth industrial revolution possesses to stabilize that global warming which otherwise has an adverse effect on the quality of life.

The inter-governmental and trans-national consensus coalescing around cities getting smart serves to concentrate attention on the structural dynamics of urban growth. This is considered vital if research and innovation are going to be successful in pivoting the scientific and technological trajectories of legacy systems inherited from the previous industrial era in a direction able to meet the SDGs of that UA which are set out by the UN and HABITAT III. The idea here is that cities, as the sites and powerhouses of urban growth, wealth creation, prosperity, health and well-being, need to be smart in terms of the research and innovation systems which they champion under the fourth industrial revolution to drive that science and technology which allows the process of climate change adaptation regions assemble to be resilient in sustaining development. To be resilient and sustain development by keeping global warming within the 1.5 ^{0}C of the pre-industrial era and at that level which is currently considered safe by the International Panel on Climate Change.

The regime change associated with securing this transition away from legacy systems and towards the structural drivers of smart cities goes under various names. As a trajectory of urban growth in the new industrial era, it is common to see smart cities referred to as a study of the research and innovation relating to the evolution of human intelligence and as either socio-technical or cyber-physical systems (Komninos, 2014, 2020; Batty et al. 2013; Batty, 2019). Irrespective of the names these intelligent systems are given, what they share is the conviction the research and innovation leading this transition to smart cities are human-centric, socially networked and cybernetic, inter-disciplinary in nature, grounded in codes of communication found in (computer) science and based on the (digital) technology of the ecosystems 21st century urban growth relates to.

The AI, IoT and machine learning of the fourth industrial revolution are the current symbols of this intelligent and systems-driven model of an environmentally just and fair urban growth. The virtuous nature of this urban growth model is as that of an ecosystem which is sufficiently bio-diverse to be dematerialised and subjected to a process of decarbonisation. Dematerialised and subjected to that process of decarbonisation which is clean and waste-free. Clean and waste-free in greening that urban growth which is environmentally just in creating wealth and fair in providing access to a share of the prosperity, health and well-being found in the quality-of-life cities around the world offer. Cities around the world offer to sustain that development which regions assemble the resilience of as the climate neutral change and net zero adaptations of nation-states.

Question 2 - You argue that a sociotechnical approach is the best suited to develop a theory around smart cities. Following the Multi-Level Perspective, exogenous factors from the macro-level of the sociotechnical landscape and endogenous factors from the micro-level innovation niches reflect in the meso-level of the sociotechnical system, shaping in fundamental terms the trajectory of development of smart cities. Can you explain specifically how public local governments contribute to shaping a smart city? Moreover, what changes do the public sector need concerning smart cities?

Answer - The intrinsic intellectual value of this human-centric, socially networked and cybernetic model of smart cities, lies in the interdisciplinary milieu it currently sits. That is, with the value the intelligence which the research into this newly emerging field of innovation offers for models of urban growth to avoid the naturalism, social, scientific and technological over-determination of the legacy system and environmental reductionism they otherwise encode into the injustices and unfairness of the previous industrial era. Codes that literally need to be rewritten and cast afresh as the intelligent systems of the fourth industrial era so the structural dynamics of this regime change can be environmentally just and fair as trajectories which green the urban growth, human wealth creation, social prosperity, health and well-being of cities around the world. Green the urban growth, human wealth creation, social prosperity, health and well-being of cities around the world that regions in turn assemble the resilience of as the climate neutral change and net zero adaptations of nation-states which can sustain development.

Not being limited to the structural dynamics of the intelligence grounded in either national or transnational research and innovation systems, nor based on either mode 1 or 2 trajectories of science and technology, this greening of urban growth is written as codes of communication. Those founded in science and based on technologies evolving into the next order logic of the triple helix. The triple helix of smart cities that evolve into the ecosystems of regional assemblages and which take on the status of a sensory system. That sensory system which assembles the collective intelligence needed for the institutions of knowledge production situated across nation-states, to safeguard research into and secure innovations from the science and technology of that fourth industrial revolution which commands the transnational status of being environmentally just and fair.

That fourth industrial revolution which commands the transnational status of being environmentally just and fair, precisely because it can green urban growth. Can green urban growth by securing that science and technology which bears down on the global footprint and overshoot in the consumption of resources. That overshoot in the consumption of resources which is environmentally unjust and unfair and the wrongs this causes, vis-a-vis rising atmospheric temperatures, excessive heat, drought, crop failures and food insecurity, is what this new industrial era aims to put right. Aims to put right by safeguarding research and innovation from institutions of knowledge production across nation states into the collective intelligence of that sensory system which evolves into a smart city. Evolves into a smart city by staging that model of urban growth which is environmentally just and fair in closing the gap between human wealth creation and social prosperity. Closing the gap between them by virtue of the green credentials this urban growth model offers to dematerialise resource consumption by subjecting it to process of decarbonisation. By subjecting it to that process of decarbonisation which is clean, waste-free and human in creating wealth from that environment which is just. From that environment which is just in allowing society to prosper from access to that fair share of the health and well-being found in the quality-of-life which cities around the world offer to sustain that development regions assemble the resilience of.

The role the public sector plays in this regime is that of an institutional body underwriting the structural dynamics of this greening and supporting the narrative on urban growth it is charged with the task of making sense of. Making sense of as that institution of knowledge production which governs the trajectory of research and innovation into the science and technology of the fourth industrial revolution so it can be safeguarded and made secure across nation-states. So, it can be safeguarded and made secure across nation-states and in terms of how the structural dynamics of such a regime stabilises this greening of urban growth. Stabilises this greening of urban growth so the fourth industrial revolution can be environmentally just and fair as an ecosystem closing the gap between the humanity of wealth creation and social prosperity. Closing the gap between them so the balance struck is no longer destructive (warming the temperature of the atmosphere to unsafe levels) but on the contrary constructively aligned (as a process of climate change adaptation). No longer destructive but instead constructively aligned as that hu-

man society which is able to create wealth that is environmentally just in providing cities around the world access to a fair share of that prosperity, health and well-being which the UNs SDGs and UA of HABITAT III deem necessary.
As an institution of knowledge production, the public sector also leads on the research and innovation required for the trajectory of this science and technology to secure the structural dynamics of that regime change which stabilise the fourth industrial revolution. This regime change requires any such discursive incursion into the greening of urban growth to both monitor the environmental justice of closing the gap between the humanity of wealth creation and social prosperity and evaluate the fairness of the balance it strikes. The fairness of the balance it strikes in gaining access to the prosperity, health and well-being, vis-à-vis quality-of-life this offers cities around the world to sustain that development which regions assemble. Sustain that development which regions assemble the resilience of as the climate neutral change and net zero adaptations of nation-states and transnational arrangements they enter.
This is the agenda of what for all intents and purposes is the new public realm. That public realm which is known as the Smart and Sustainable Specialisation Strategy (the so-called S4 movement) and policy of that next order logic which not only greens urban growth but is also environmentally just as that human wealth creation which is fair in providing society access to a share of that prosperity, health and well-being which stand in as a measure of the life chances found in cities all around the world (McCann and Soete, 2020).
This is also the so-called 4-all agenda of the new public realm advanced by the UN and HABITAT III, in the sense which the balance it strikes between wealth creation and prosperity is both humanitarian and social, closing the gap that otherwise exists between them (human wealth creation and social prosperity) by getting smart about the greening of urban growth. Getting smart about the greening of urban growth as an environmentally just creation of wealth and fair sharing of that prosperity, health and well-being which is fit for purpose by virtue of them standing in as a just and fair measure of the life chances cities all around the world offer humanity and everyone in society wants access to.

Question 3 - The project of "smarting" the city requires the utilization of Information and Communication Technologies (ICT) at large. Indeed, even if scholars continue to discuss this issue, at least in the Western context, and at least in big cities, an ICT-driven approach seems to be a milestone. As many scholars have pointed out (e.g., Eskridge, 2019; Zhuravleva et al., 2019; Martinez-Balleste, Perez-Martinez & Solanas, 2013) this poses a new problem, which is the property of a large amount of data that stays at the edge between personal and public. Moreover, we have seen in other contexts that private companies do not always comply with legal requirements when it comes to managing these data (the most famous example being, maybe, Facebook). In a context where the development of cities is devolved almost entirely to private actors, which kinds of opportunities and threats represent the enlargement of private owners of personal data?
Answer - Yes, this is a concern about the rise of smart cities that emerged early in debates on the trajectory which they follow. They refer to the rise of smart cities as corporate organisations with agendas dominated mostly by the experiments of large tech companies rather than the democracy of that rule-of-law which otherwise governs the public realm. The critique they offer tend to be of the self-declaratory claims which the high-tech companies championing smart cities offer as neo-liberal models of 20th Century industrialisation and by extension the natural, social and technologically over-determined visons of how to manage the urban growth of cities around the world.
While valid research questions, focussing attention on the so-called civics of smart cities, rather than the socio-cybernetic research-driven and innovation-centric rendering of them offered here, means the criticisms are not so much scientific or technological but cultural, concerning those wider divisions they may open within society. Those wider divisions that may open up in the event the environmental injustices of the wealth creation and unfair share of prosperity,

health and well-being which they currently offer access to, continue to be the humanitarian grounds and social basis of that urban growth agenda which cities around the world adopt as climate change adaptations able to sustain development.
As this brief rendering of the smart city agenda has sought to communicate, the division such critiques draw between the sociology and cybernetics of the physical and social sciences do not cut so deep. Do not cut so deep as to open divisions of such a magnitude it is unable to bridge. For on the contrary, there is growing evidence the institutions of knowledge production across nation-states are conducting interdisciplinary research and innovation into that science and technology which can bridge them as transnational arrangements. Can bridge them by studying smart cities as the science of that intelligence which is embedded in the transnational arrangements of either sociotechnical or cyber-physical systems.
This in turn suggests the inertia in the emerging socio-cybernetic discourse on smart cities can be broken. Can be broken by those intelligence-driven models able to get beneath the veneer. Able to get beneath the veneer and delve deep into the structural dynamics of the research and innovation brought forward as the science and technology of the cybernetics found in the social networks and physical arrangement of that ecosystem which cities around the world collect data on. Which cities around the world collect data on, process information about and now render as intelligence relating to the environmental justice of wealth creation and fairness of sharing the prosperity, health and well-being that is smart in greening urban growth. That is smart in greening urban growth as a dematerialisation which decarbonises resource consumption, so it is not only clean, but also waste free. That decarbonisation of resource consumption which is the clean and waste free revolution of the fourth industrial era. That fourth industrial era which stands apart from the grey shadow of the business-as-usual model legacy systems otherwise cast, by virtue of the clean and waste-free status the climate neutral change and net zero adaptation this greening of urban growth champions.
Unlike the legacy systems, the fourth industrial era stands apart as a resource consumption that is dematerialised, and which is subject to a process of decarbonisation commanding that clean and waste-free status which is revolutionary in nature. Which is revolutionary in the sense the clean and waste-free status of this ecosystem can bear down on the global footprint. Can bear down on the global footprint and overshoot in the consumption of resources otherwise associated with the warming of the earth's atmosphere. Bear down on the overshoot otherwise associated with global warming by striking a balance between them on the grounds the humanity of wealth creation is the social basis of prosperity.
That is on the grounds and basis of a wealth creation which is humanitarian and society prospers from for the reason the balance struck between them is environmentally just. Is environmentally just in closing the gap which otherwise exists between them and because the wealth this creates is also fair in providing access to a share of that prosperity, health and well-being which the clean and waste-free status of this climate neutral change and net-zero adaptation to global warming offers. Which such a climate neutral and net-zero adaptation to global warming offers cities around the world access to as that quality-of-life which smart cities stage and regions assemble the resilience of to sustain the development of nation-states and transnational arrangements they enter.

Question 4 - The implementation of ICT devices and infrastructure has become so pervasive that in some literature streams 'smart city' and 'ubiquitous city' are considered equivalent since the rate of interconnection between infrastructures has become almost all-encompassing and everyone is connected to them. Considering the continuous technological advancements (machines never stop) and the massive deployment of highly sophisticated techno-robotic devices in many smart cities, in your opinion, why do climatic events remain a scourge, particularly in European cities? In this regard, we would appreciate your insights focusing on geographically limited areas, including your perspective on Italy. Additionally, could you provide at least one example of a virtu-

ous city that has effectively mitigated the impact of climatic events thanks to ICT infrastructures and another example of a city that has struggled in this aspect?

Answer - The experience of climate change in Europe's Mediterranean region is of summer heat waves, forest fires across Portugal, Spain and Greece, followed by torrential downpours and flooding. These outbreaks might be best understood as symptoms of global warming and pressure the ecosystem has not so far been able to absorb with respect to the devastation this unleashes.

These humanitarian disasters do not happen due to the absence of metrological models able to predict such events, but on the contrary, the failure of society to adapt to the climate change they signal the existence of by either absorbing the pressure urban growth loads onto the ecosystem or mitigating the adverse effects such extreme weather events have on cities. As man-made disasters, caused by the over-exploitation of natural resources and destruction of ecosystems, the containment of such catastrophises is proving to challenge public authorities and calls for a smarter real-time strategic management of cities.

The challenge the new public realm in cities face is to co-ordinate a multitude of communication platforms, capturing real-time data on these extreme events and processing information that feeds into hubs for strategically managing the otherwise devastating impact which they have. The absence of these hubs as platforms for emergency planning, also serves to expose the limitations of such databases and information systems. The fact they are only informational, processing data and circulating information to the agencies that are responsible for the strategic management of such events and warning the public about them.

What this information does not offer cities is the intelligence needed to appropriate a scientific knowledge and technological understanding of the extra capacity ecosystems must have to carry the additional weight of any such environmental loading, or the climate change adaptations required for any ongoing greening of urban growth to absorb the adverse impacts of such events in terms of the damage they otherwise cause. Meeting this strategic management challenge means appropriating knowledge of extreme weather events that moves beyond the informational and which progresses research and innovation towards an understanding of them in scientific and technological terms. This in turn means demonstrating how platforms of remote sensing, AI and the IoT, can work as self-reflective learning machines. Self-reflective learning machines automating in real-time the strategic management of climate change adaptation programmes with the wherewithal to strike that balance between wealth creation and prosperity that is environmentally just and fair.

That balance which justly safeguards the environment from the damage extreme weather events otherwise cause, by virtue of this being fair in securing access to that share of the prosperity, health and well-being which cities around the world are now beginning to stabilise as climate neutral and net zero adaptations. As climate neutral and net zero adaptations that manage extreme weather events by bearing down of the global footprint and any overshoot in the consumption of resources and which allow this greening of urban growth to dematerialise resource consumption. To dematerialise resource consumption as the decarbonised, clean and waste free era of that fourth industrial revolution which smart cities around the world are now beginning to stage. Smart cities around the world are now beginning to stage and regions assemble the resilience of to sustain the development of nation-states and those transnational arrangements which they also enter.

Cities that are smart in mobilising the intelligent systems which are needed to green urban growth and as the climate change adaptation regions assemble the resilience of, include Sonderborg, the Hague and London (Brem and Radziwon, 2017; Werker et al, 2017). These climate change adaptations are found in the nation-states of Denmark, Holland and the United Kingdom and transnational arrangements they in turn have with Europe.

As intelligent systems drawn from the triple helices of university, industry and (local) government, the municipalities of these cities have been smart in undertaking research and conducting

innovation into the science and technology of renewable energies as nature-based solutions. Nature-based solutions that dematerialise the consumption of resources as renewables and which capitalise on the decarbonisation opportunities physical science and engineering technologies offer for the clean and waste-free design and construction of built environments to drive these adaptations towards the climate neutrality of net zero.
In London the research and innovation relate to the science and technology of IoT based, AI supported and machine learning-driven platforms. Those found in the instillation of smart micro-grids and as a stage for the storage and distribution of energy generated from solar power and wind farms. In Sonderborg and the Hague, the research and innovation relates to the science and technology of hydropower as a climate change adaptation. That adaptation which also dematerialises resource consumption by leading on that decarbonisation of energy as renewables which offer a clean and waste free greening of urban growth that is environmentally just and which is fair.

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SEZIONE FUORI LUOGO

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Certifying Credibility: Trajectory of Sub-Saharan asylum seekers in Italy[2]

Introduction

In the last decade, migrants arriving in Europe for asylum have occupied the threads of discourse on immigration. Amid the so-called «Europe's refugee and migrant crisis» protection seekers' quest to legal protection has been activated under an increasing enactment of border regimes (Artero and Fontnari, 2019), migration-control-policies (Hess and Kasparek, 2017) and immigration law enforcement (Hess and Petrogiannis, 2020). Hindrances of border control, push backs and the tightening of asylum procedures have become the norm of EU's approach «against the abuse of its asylum system» (Agenda on Migration 2015). Today, with the ongoing implementation of the New Pact on Migration and Asylum, asylum determination is increasingly problematic; it calls into question tensions between the governance of migration and practices of protection seekers.

While a large line of scholarship has underscored the tensions between the governance of migration, bureaucracy and street-level practices (e.g. Griffiths, 2014; Schapendonk, 2017; Artero and Fontanari, 2019), asylum determination procedures were little developed (Gill and Good, 2018). The deficiency in research on the dynamics shaping asylum determination exposed the lack of capture of asylum policies *in action* and the role potentially played by asylum seekers within the asylum labyrinth. Attempting to fill this gap, recent studies have examined processes of decision-making in the European asylum determination system (e.g. Sbricolli and Jacovielli, 2011; Gill and Good, 2018; Kobelinsky, 2018; Gibb, 2018). This line of analysis has challenged the doctrinal apprehension of asylum determination procedures as fundamentally animated by the right and the law. It has shown ways in which asylum procedures are strongly grounded in certain social and political contexts, underscoring thus ways actors involved act and reshape the course of the procedures. Notwithstanding the relevance of the existing research, the experience of asylum seekers through procedures of determination is under-researched, often compensated by the narratives and practices of the formal actors (administrators, judges, lawyers, case-workers, etc.). Again, asylum seekers were depicted as 'passive' victims, shaped by the power of asylum procedures' control. This representation incorporates losing touch with a growing reality on asylum determination practices: migrants' ability in conveying and certifying their eligibility to protection in arrival countries. To go along with Gandolfi, "we intend here to consider in particular the dynamics of asylum seeker flows as one of the relata that has specifically marked recent migration dynamics in Italy and Europe from post-2011 to adj"(Gandolfi, 2018: 13).

In this paper, we argue that asylum determination procedures are not evident and unidirectional; they rather comprise diverse forms of credibility certification upon the substantive interview. Here, the emphasis is made on ways credibility assessments in the substantive interview are experienced, negotiated and certified by Sub-Saharan protection seekers. We study migrants' practices by highlighting different situations in which migrants are coerced to produce certifications of their vulnerability. The proofs provided by the protection seekers might be fabricated, factual or fantastical ; however, they are inscribed in realities and a world, and they offer the possibility of resisting exclusionary practices of asylum determination procedures.

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Fieldwork:
The fieldwork was carried from October 2019 to June 2021. This period can be split into two moments parts: the first consists of staying immersivity fully immersed in Mestre, and residing there. This allowed shaping the everyday activities of one of the authors along the line of his encounters with the interlocutors. The other author privileged expeditive visits to stimulate an external vision and nuance the immersion of the other researcher. By doing so, sight was gained of ways our personal world can merge with that of the subjects and ways we can mitigate risks of emotional immersion. Be that as it may, the second period was marked by the first national lockdown in Italy. This has implied the compliance with confinement guidelines. Despite that, the empirical research was ongoingly conducted by one of the authors. It required an adjustment of research tools and methodologies. While before testimonies were collected through face-to-face interactions, at that moment we will rely on phone interviews through secured end-to-end encrypted channels. In fact, this virtual interaction has influenced the density and the spontaneity of the exchange. Many conversations were hindered by the expression "*when we meet in person, I will tell you more about that*". In this setting conversations will be directed more towards the various legal statuses each interlocutor has acquired and lived experiences after the abolishment of the humanitarian protection with the Legislative Decree 113/2018 (which makes the subject of another forthcoming article). With the lifting of the national lockdown by the mid May 2020, encounters with the interlocutors will be again possible. Here, one of the authors will carry two more months of fieldwork and collection of testimonies and anecdotes on ways legal statuses were acquired and also ways they were lost.
In both cases, data collection revolved around testimonies and anecdotes accounting paths crossed by Sub-Saharan protection seekers coming from the so-called 'safe' countries of origin when encountering asylum determination procedures. One of the themes emerged was they learned to tell their stories of persecution to covey eligibility to protection. Access to interlocutors was built on referral sampling. Ten biographical interviews were conducted with migrants from Nigeria, Sudan, Gambia, and Senegal who landed in Italy after the fall of the Gaddafi regime and were channeled to apply for asylum. The sum of information came from a very specific group of migrants; those denied asylum at the first claim. The insights gathered were very useful to understanding the experience of certifying one's credibility to legal protection upon asylum determination procedures.
For one of the authors, when arrived in Venice, it was quite difficult to find private accommodation in the historical center while being new-comer and holder of a Moroccan passport. He was left with the option to live in the peripheral city of Mestre, where many migrants reside. He ended up residing in Via Piave, Mestre, a neighborhood known for the presence of the Sub-Saharian migrant population. That is how he got to meet many people from Sub-Saharan Africa in bars and parks of the neighborhood.
He was introduced to C., the interpreter, by another informant. This person has worked in Italy, for a long period, with several Territorial Commissions as an interpreter from French, Arabic, and Kurdish to Italian. He himself is an established refugee from Iran. The authors have managed to weave contact with two legal operators, D., and L.,. They were law students in the university of Venice and politically engaged in a pro-migrant collective assisting asylum seekers in the Region of Veneto. Through them we managed to meet a former case-officer who used to conduct the asylum hearing interviews in the region of Sicily.
S., a 43-year-old Nigerian male, that we met in a birthday party of a Nigerian woman at AD hostel in Mestre. Around a cigarette in the garden, we got to know each other. As the author declared Moroccan, S., curiously asked about when and how he arrived in Italy. A student, he presented himself, who is in Venice and interested in knowing about the problems faced by migrants in Italy. S. miled and said: "you *are African, you don't know them?".* Through the course of our conversation, we talked about being (ir)regular, asylum seeker, and ordeals linked to these situations. S. would say: "*I am legal here in Italy, but before being this I had to do a lot of things brother, problems... problems as you arrive*".

The coincidence of the encounter has provided a proximity of being "the African who should know about these problems". This positionality has established a sort of proximity that goes beyond the usual distance between the researcher and the researched – at least in the eyes of S. We established a space for co-producing narratives on our experience with the immigration bureaucracy in Italy despite our different migratory trajectories.

We would meet S., regularly, after work, we would go to a bar where "African brothers" (as he called them) gather. Being introduced to his friends as the Moroccan student who just arrived in Mestre has allowed me to know more people who arrived in Italy upon Emergency North Africa, who were denied protection and who appealed to challenge the denial of their claim of legal protection.

Investigating a vulnerable population is not an easy endeavor; it requires attentive modalities of access and integration into the migrants' community (O'Reilly, 2009). During the first two months, the priority was to spend time and socialize with people from Sub-Saharan Africa. As Africans ourselves and being visibly 'non-European outsiders', we claimed our African identity. This allowed us to build a certain proximity with our interlocutors. Being migrants in Europe has opened rich perspectives in terms of proximity and exchange with our respondents. In this situation, proximity is a variability, which can be cultural, geographical, or through the migratory experience. This might go against a classical anthropological approach that preaches distance as a form of objectification. In fact, our proximity was not emotional, it is rather expressed in terms of codes and references shared with our interlocutors, which facilitates the understanding of both the cognitive and the pragmatic logics of their migratory trajectories. The stay in the field was not here regulated by some professional norms (expeditive, time-line, extractive), it was rather an immersion in a space of everyday life and encounters. This ethnographic *démarche* allowed us to identify six subjects with whom we conducted in-depth biographical interviews to restitute their experience in dealing with asylum determination procedures. Restituting testimonies have resulted in tracing actors gravitating around the asylum determination procedure.

People we met would tell me stories of how they managed to deal with the denial of their claim to legal protection when arrived to Italy. By telling their stories, they would also testify on case-officers, interpreters in asylum hearing setting and on lawyer that facilitated and/or constrained their quest to legal protection. Thus, we identified the actors gravitating around the asylum determination and credibility assessment through their testimonies and meet these "knowers" of the occurrences accounted.

A., a Gambian male and one of the protagonists of this research, will become our second informer. Punctual encounters in cafés will become frequent in X park and sometimes in our house. Proximity allowed a dense discussion around the experiences of access to legal statuses of protection. Shadowing A. allowed encountering other migrants who willingly narrated their experiences. Being allowed to narrate what is important to them, while being actively heard and assisted to put their experience into expressions brought about some level of trust, and therefore going beyond the rigid protocols of interviewing. Respondents were informed that their statements would be used for fundamental research and might be publicly available for journal publications. By being seen as an "African brother", we managed to enter the everydayness of the people I encountered. Being there, not inhabited by the extractive urge **to** know about people's privacy, has allowed us to be seen as allies. Entering the realm of their anthropological 'truth',(to be deleted) was possible due to the proximity of origin, the fact that we share bureaucratic ordeals with the immigration system in Italy, but also the non-extractive posture of being there and allowing their words to unfold without forcing it into the rigid protocol of the interview and the expeditive research. Therefore, instead of building a model around Sub-Saharan migration, we have sought to explore the experiential dimension of the migratory journey and underscore the meanings allocated to contexts encountered by migrants themselves, and how they navigate and situate themselves vis-à-vis the continuum of constraints and facilitations. Hence drawing on a collaborative, embodied, critical and engaged *performance and imagi-*

nation, (Kazubowski-Houston *et al*. 2018) in constructing the respondents' personal testimonies. It is important to underline that the data was collected on the basis of a dialogical attitude with the interlocutors met. We would look at anecdotical occurrences, experiences and ways we dealt with constraints. We privileged the density of the anecdotes, and of the events they were involved in. On top of that, collecting testimonies through personal accounts helped to understand not only what is happening but also the reasons behind what happened. Building of dialogues allows sensitivity to the logics, both cognitive and pragmatic, behind the structured life-stories that are often oriented towards specific assumed events. In fact, the testimonies were analyzed and sorted in many themes: (1) (re)shipment of credibility; (2) encounters with facilitators; (3) navigation of asylum determination procedures; (4) legal statuses mobility, etc. For the concern of this article, the data from which our argument has transpired was analyzed with the aim of the following ways: (re)shipment of credibility shifts, its locations and the way it transforms depending on encounters with peer-migrants and other allies. Evidently, the interlocutors have a lot to tell us, and for the researcher it is an opportunity to develop a hermeneutic of practices (Bourdieu, 1977: 1) and therefor restitute an approximate image of how credibility is acquired, circulates across spaces and shapes protection seekers' access to legal status. The analysis of these testimonies passed first through the restitution of lived experiences, and then considered the subjective dimension of the narrative. We avoided resorting to the somewhat enigmatic concepts and over-interpretations. Rather we allowed the testimonies to (re)organize to give an image on how access to legal status of protection is shaped in this case. The interest was to guarantee the testimonies produced indicate something of the "reference reality" (Cf. Olivier de Sardan, 2008) and without urging to some excessive over-representations and generalization. An agreement was made on changing their names and the names of places in our ethnographic notes. However, four interlocutors sharing their personal stories was neither a matter of evidence nor empty of meaning and interest. Their interest in telling their personal stories sometimes had a denunciation-like agenda; some interlocutors demanded to make visible their precarious legal situation. As O., said, «Europe is not the Promised Land for refugees; people must know what refugees, even those with documents, live in Europe». In other cases, narrating one's story was often animated by an advice-related interest; the expression «do you think I made the right move? » comes more often during the exchange with the interlocutors. The time when the fieldwork was conducted is marked by legal intricacies for refugees in Italy. After the legislation of Security and Immigration Decree 2018 abolished the humanitarian protection, refugees coming from the so-called 'safe' countries of origin have faced several bureaucratic constraints and withdrawal of the legal protection they were granted previously. Several interlocutors did ask for information about the *Questura*, the current asylum procedures and the practices of bureaucrats. Additionally, as Sub-Saharan migrants have occupied the threads of discourse on migration to Europe in recent years, it is common for migrants to be approached by academic researchers and journalists aiming at reporting their situations. Ab., depicts, «you will always have someone coming to you asking you about your life, just because you are black [...] every time, journalists ask you about how you live… I tell them you want my story… then pay me for my time».

Integrating the migrants' community and broadening the relationship not only offer an advantage to understand how different people can justify themselves individually, but also made visible individual paths of the subjects' situation, the production and fabrication of the trials of legalism of one's path and of one's singular suffering, as can be incorporated as a reference to very general forms of justice.

Governing the 'unwanted': from 'threat' to 'victims' and back

The uprisings occurred from the year 2011 have influenced the governance of migration and border control between the Southern and the Northern shores of the Mediterranean. These

events are interpreted as the 'crisis' of the European border regime (Campesi, 2011). The fall of Gaddafi and Ben Ali regimes provoked an important number of people landing on the Southern Italian coast, principally on Lampedusa. In official discourses, arrivals of migrants were seen as an emergency and a conquest by the south. The images circulating in the media of Italy have structured public opinion, but have also fed anti-migration reactions, images and videos that have become an argument for populist parties in Europe in general.
Considering its position as a front-line EU member state, Italy, has established the Emergency North Africa program (ENA). Arrivals of protection seekers at that time were framed into a blurry governing response both in discourses and policies: they were subjects of 'compassion' when treated as helpless subjects and victims, as well as a threat to the national order under the frame of the fight against illegal immigration (Pallister-Wilkins, 2015). On this basis, asylum claims were structured as an issue of security and a problem of public order: the main duty of the asylum administration, then, was to defend the security of its territory by identifying those perceived as counterfeit protection seekers, rather than ensuring access to asylum rights. To compromise with the principle of *non-refoulement*, in the best-case scenario, the territorial Commissions[3] have issued temporary protection (i.e. humanitarian protection) to those deemed as 'victims' of war. The complexity of this context calls into question both the practices of asylum determination as well as the ways in which protection seekers navigate the administrative environment governing their cases. Thus, we ask: how have asylum seekers framed as counterfeit navigated the asylum administrations and certified their eligibility to legal statuses of protection?

Credibility assessment: which is which and who is who?

In Italy migration is governed by the Bossi-Fini law of 2002 (Lalli *et al*, 2022). Under this law, the legal status of an immigrant is subordinated to the presentation of a regular work contract, which leads to a fluctuation in the legal status of migrants. As a result, the loss of status can occur at any moment of economic crisis, for which migrants are the first to pay the price, «in 2009 the so-called 'Security Packet' furthered this apparently tough stance on immigration. The bill included a dramatic rise in the cost of permit renewal, and it made the status of 'illegality' a crime» (Tuckett, 2015: 115-116). Given the difficulty of accessing legal statuses, migrants arriving in Italy, either fleeing wars or escaping disastrous political and economic conditions in their country had to cross the asylum channel and certify their suffering and eligibility for protection.
For protection seekers who landed alive on the Italian shores, asylum determination procedures have always been problematic, especially when they cannot provide other types of material evidence (e.g. documenting persecution lived) in certifying their ordeals of persecution (Coffey, 2003; Sorgoni, 2019). Classified by countries of origin (safe country of origin[4] or in calamity country of origin) and type of lived ordeals, less consideration is attributed to individual cases. Nowadays, in the Italian asylum system, lack of credibility is an often-used motive for the rejection of protection seekers' claim upon asylum determination procedures (Asilo in Europa, 2020).
After their journey through the Mediterranean Sea, protection seekers are rearranged in camps and centers to be identified, registered, and channeled to asylum determination procedures. The asylum labyrinth commences, and protection seekers have to certify their fears of persecution to the agents of the administrative bodies in charge of the examination of their asylum stories. By exploring the testimonies of interlocutors, uncertainty and lack of information on asylum procedures have been underscored. As narrated by O.,.

3 In Italy, Territorial Commissions are administrative bodies in charge the first extended interview and the first decision on international protection.

4 In the EU asylum Directives, a 'safe country of origin' is defined on the basis of the current legal system and the general political situation in the asylum seekers' country of origin. A country is considered safe if there is no war nor acts of persecution nor torture or other forms of inhuman punishment are visibly deployed. In 2018, with the so-called Salvini/Security law, Italy adopted its list of "safe country of origin'.

"*In the beginning we were many, all in the camp. I had no idea about what will happen to me [...] you know, I spent a long time there. One day they sent me to do the [substantive] interview... They ask you to speak about your life ... I was confused. I did not know where to start or what to say... I knew that every wrong word will influence my life*"
(O., a Nigerian male 8 years in Italy, temporary protection of one year, renewable. Marghera, December 2019)

On the same line B., brings to attention issues of (mis)communication and interpretation during the substantive interview. He explained:

"*When I was telling them [agents of the commission] my story, we seemed to not really understand each other. The interpreter was not saying my words correctly... I could not complain at that time... They were interpreting what they wanted [...] I said to myself 'asking for protection in this country without knowing the language is like being in a cave searching for treasure without firelight in your hand' [...] You see, they did not trust me and I had no lawyer... so my story was denied*".
(B., a Gambian male 7 years in Italy, subsidiary protection of five years, renewable. Mestre, May 2020)

Testimonies of the interlocutors have informed on ways they experience the interview for asylum determination. They had to tell their stories of suffering and helplessness in order to be deemed as eligible to the legal protection, or as 'counterfeit' applicants abusing the asylum system. In this situation, protection seekers have had no other medium to certify their suffering besides narratives on ordeals lived. The ordeals of communication, interpretation and lack of information appear as salient elements influencing the course of their asylum determination procedures in this stage.
Our aim to nuance testimonies on the practices in the substantive interview has directed the gaze to official actors of asylum determination as well. D., a caseworker operating with an Italian Territorial Commission, whose task was to conduct case-interviews and then report whether the case in question met the guidelines on credibility assessment or not, has testified on aspects of their examination exercise during the substantive interview. He clarifies.

"*In the interviews we need to follow guidelines and evaluate if the applicants in front of me fits inside the guidelines [...]. Sometimes I feel like they are telling me the right story, but they are not telling me the right things that fit into the guidelines. When I feel that the claimant tells a coherent story, I ask further questions, rephrase what they say in the right way and ask for the applicants' validation to what I propose [...]. When the claimant is incoherent, I do not do so [...]. I do this to help truthful people to say their stories in the right way*."
(D., an Italian Ex- case officer who operated from 2011 to 2015 Venice, January 2020)

D.'s testimony triggers questions about ways in which caseworkers enact their own understanding of coherency, thus shaping the setting of asylum storytelling. As he presents it, protection claimants judged 'truthful' are subject to guidance through story-generating questions and paraphrasing, while those who are not seen as such are left on their own. To him, this type of assistance must be provided to help those who have shown a certain degree of credibility so that they can fit into the credibility assessment guidelines in force. Daniele's testimonies allow us to gain insight into the ways in which evaluators can rely on their subjectivity in sorting 'trustworthy' versus 'counterfeits' claimants.
By referring to the EU asylum procedure directives, D mention two types of coherence that asylum seekers must meet:
1) Internal coherence which consists of a) sufficiency and specificity of the details; b) internal consistency and the verbal facts of the applicant; c) applicant's behavior and plausibility.
2) External coherence which resides in a) consistency with the specific and general information available by international reports; b) Plausibility of the narratives of the applicants in a given context. All in all, he insisted that the chronology of events that protection seekers offer, the modalities of narration, and the severity of their portrayed sufferance are important elements for the credibility assessment during the substantive interview. Thus, the caseworker concluded saying:

"*In our work, a lot of people will come to you claiming to be victims and refugees. Your job is to tell which is which and who is who [...] at the time of emergenza nord africa we had a lot of applications [...] when you have too much people to examine sometimes you skip some protocols, because simply you cannot evaluate that amount of people according to the guidelines*".
(D., an Italian, Ex- case officer who operated from 2011 to 2015 Venice, January 2020)

The occurrences described above coincide with findings of anthropologists who have examined the same setting. As Sbricolli and Jacovielli (2011) have underscored, the asylum hearing « imply a dialogue between narratives of persecutions and normative and political expectations of the decision-making authority, asylum is (...) a process through which the subject's identity is constituted (...) in relation to a legal and political framework to which the applicant is forced to adhere, and thus forming a new state of the world through adjusted narratives » (Sbricolli and Jacovie, 2011: 187).

On the flip side, the totality of the refugees encountered in this research was denied protection on their first attempt. The official reasons given were « lack of credibility » and « abuse of the asylum channels », leaving them in the limbo of illegality (Cabot, 2012: 16). When the judgment took place and their cases were denied, protection seekers sought assistance to appeal and challenge the denial judgment on their claims of protection. The subjects we interviewed were not passive regarding the denial of their claims. They have engaged in a quest to restore, rearrange, and resume their personal story of persecution through gaining information on the constitutive definition of credibility in the Italian asylum procedures.

In the quest to restore credibility:

Once denied, some protection seekers engage in circulation, in the quest of assistance to challenge the denial of their claims to protection. While some of the interlocutors have left the reception centers seeking assistance and appeal for their cases, others remained at reception centers waiting for their cases to be processed by Territorial Commissions. In both cases, protection seekers have built on encounters that have provided them with information on the Italian asylum bureaucracy and they have found some assistance to appeal their cases. Protection seekers often refer to the capability of other refugees, migrants, social assistants, and even asylum seekers sharing their situation to inform about key information, routes to follow, and cities to move to in order to gain assistance. These actors are conceptualized here as *bearers of information, they* can be anyone who can help protection seeker, in different ways, to access to legal assistance, adjust the narrative of persecution, match their story with the criteria of the constitutive apprehension of credibility assessment in force and therefore acquire an interstice in the channels of legal protection.
In the case of B., he abandoned the center seeking a 'better' place to apply for asylum. Denied in Trento, he continued his quest moving around cities. He ended up in Ventimiglia, at the Italian-French borders. He managed to cross the border to France. Attempting to claim asylum in France he was deported back to Italy according to the Dublin regulation. He headed next to Torino where he found assistance to challenge the denial of his claims.

"*In Torino I found associations helping migrants and refugees; there, they accept refugees [...] after being here and there and everywhere... meeting other refugees on my way, I have learned a lot of things about how these people [asylum bureaucracy officers] work. I also knew where to go and where not [...]. I made lots of wrong calculations, but in 2014 I made a good case, they gave me humanitarian asylum [...] my story was strong.*"
(B., a Gambian male 7 years in Italy, Mestre, May 2020)

In his quest for credibility, B. sought assistance to challenge the denial judgment on his asylum claims. After two years circulating around two countries undocumented, he was granted a hu-

manitarian protection after making a 'good' case. He established contacts with asylum facilitators and gained orientation and information on the asylum bureaucracy, challenging thus the denial on his asylum case. Building on his testimonies, encounters with peer migrants, refugees and pro-migration associations can provide protection seekers with knowledge about circuits of circulations, bureaucratic procedures, and elasticity in implementation of the asylum law in force. His narrative allows us to gain insight on the hybridity of assistance he gained along the way; it was not limited to solidarity from formal actors in the asylum field (NGOs, lawyers, social-workers, etc.) it was also maneuvered among *migrants-bearers-of-information* (refugees, asylum seekers, interpreters, etc.). This type of assistance is not unique. It extends to other interlocutors deemed not 'sufficiently' compliant with the credibility criteria in force. As most of the interlocutors have informed, ways to certify one's persecutions and sufferance, circuits of circulation and assistance are a salient part of the exchanges among asylum seekers, their peer migrants and assistants. In this way, we can explain the choice of cities and region where illegalized migrants appeal the denial on their eligibility to protection. Words-of-mouth about the specific places where help, support and facilitation can be acquired are often conveyed through telling personal stories and feedback rather than institutional indications. There is always someone you know who has already gone through the procedure and may inform you about reliable ways to overcome illegality. With that being said, curiosity is raised on how these subjects « *make a good case* » as many have pointed?

"They need to hear a good story": from fragmentation to consistency

From what emerges from the collected testimonies, overcoming the credibility assessment and finding an interstice in the asylum legal channels can be materialized through delivering coherent narratives of sufferance and persecutions. These narratives are here seen as the medium to certify one's fear of persecutions and, to an extent, eligibility to legal protection.
While some anthropologists have argued that translators (Sorgoni, 2019) and lawyers (Sbricolli and Jacovielli, 2011) play an important role in the asylum hearing settings and influence the nature of the narratives provided by the protection seekers, producing thus a textualized subjectivity (Sbriccolli and Jacovielli, 2011), in which asylum seekers are deemed to be passive subjects losing control over their own history. We argue differently that in this process, some asylum claimants acquire a circumscribed control on their narratives of persecutions - particularly after their encounters with the "knowers" of techniques in conveying credibility - as they shape their own stories to fit into the practices in force. It is true that assessment of the narrative credibility is a complex procedure as it implies an unbalanced power relation where the subjectivity of heterogeneous actors (i.e. judges, case workers, interpreters, asylum claimants) is involved. However, basing the asylum determination decision on the credibility of narratives is not only productive for the judges of the Territorial Commission (Sorgoni, 2019: 167) - as they conclude cases in shorter time to meet the guidelines. It can be also productive for protection seekers when they are disposed of knowledge on how to tell a coherent story of persecution to meet the normative and the institutional expectations. The narrative credibility is actually a contested space by asylum claimants too. These subjects enact their circumscribed agency (Cabot, 2012) on the narratives and (re)shape it to gain an interstice in eligibility to protection. It is important to also consider the role of protection seekers in navigating their connections to gain information and knowledge on ways to present themselves upon the asylum hearing. Here, *bearers of information* and knowers of the asylum hearing setting appear to be a resource often accessible to some migrants to overcome the coercive practices of suspicion, institutional expectations and denial of eligibility to protection seekers coming from the so-called 'safe' countries of origin.

> "Myself, O., B., and A.,, sitting in the bar in XY; the people are gathering to watch a football match scheduled at 19h45 [...] a man walks by and attracts A's attention. A., calls on the man ... Onwa is his name.

He was asking for a person called Adbbi. A., engage in a conversation with Onwa in Nigerian. After a few moments, Onwa went outside to talk with another person. After an exchange between O., and A., Ogbwa addressed me saying: 'you know why he came here? He received a second refusal, he was running after his papers for a while…' O., told me that Adbbi, the man sought by Onwa, is actually a person with good connections with lawyers and NGOs helping migrants. He explained how Adbbi knows everything about stories of asylum as he helped many people facing similar problems […] B., commented saying: when people arrive here, they do not know anything, but you find yourself with many brothers like you. Some arrive with a plan; they aim to go to places where they have their friends or their family and where Italians help migrants. Once here you start to know where to go and with whom to talk."
(Ethnography in a bar in Mestre, February 2020)

Following our quest to grasp ways the 'good' story is (re)shaped, we sought to encounter these "knowers" of the asylum hearing settings. In fact, people sharing such conditions or those who went through this before are brought together through a sense of a *shared and mobile common* (Trimikliniotis et al., 2022). Also, the social proximity is a key factor in the access to "knowers" and facilitators having at their disposal required information and knowledge to tell one's story of persecution.

"*You have to go through lots of problems and adventures, only then you start to know how they function (the asylum determination agents). In some part of this country, you are seen as dangerous to them, you are black! If you know where to go and if you are lucky, you can have asylum. Some will just tell you stories of something not real. You have to find your people those who want good for you. I met many that helped me to find a good lawyer that will help me and tell me what to do and what to say to the judge to have asylum (...). My story was strong. You know, it is an international law, if you have the political asylum; Italy is obliged to give you papers... I could speak Italian by then and say what I want. I really needed it in order to help myself and find people who can help me. I decided to stay here to have my papers, going to France or somewhere else was not a good idea, they will always send you back*.".
(D., a Senegalese male 9 years in Italy, Mestre, January 2020)

Indeed, the knowledge network function through words-of-mouth, which protection seekers encounter as they move. The first source of information about these nodes of facilitations and knowledge are always migrants themselves, settled refugees and their broader community. This is because it is easy to trust people you know. "Who to trust" is a crucial element in this dispersed infrastructure of information. Telling one's story go beyond the aim to covey eligibility to protection, it is also a function to the circulation of information deemed helpful to adjust one's path in the quest for protection.

To follow on the trajectory of (re)shaping and knowing how to tell a story of persecution, we discussed with an established refugee who operates as an interpreter with an Italian territorial Commission. He also provide informal assistance to protection seekers aiming at making their stories coherent and credible to the institutional expectations. This figure disposes of a fine knowledge of questions asked and evaluations depending on the country of origin.

"I helped many people to tell a good story... I make their stories worth telling... if someone is lying, they (case officers and commission agents) can always know it. I know how the people of asylum work; I know their questions. They know the mentality of the refugee. They ask you like your mother. I did many interviews and I know what they ask according to each part of the world, I know that. Some will be asked about the war in Syria and the experience in the Balkans; some will be asked about Libya and Soudan and the Sahara. The rest is your story, focus on the details and do some cleaning of your story. And try again to tell it to yourself in front of a mirror. You have to believe it. After that, find a good city where there are not many asylum seekers and where the prefettura is doing good to the asylum seekers..."
(F., an Iranian male 12 years in Italy, Marghera, May 2020)

During our discussions, F., would be advancing his practical experience with asylum interviews, F., considers that the core element shaping decisions on asylum requests resides in the way per-

secution stories are told. In a situation where the claimant disposes of no other form of certification, they are required to convey their fear of persecution through a personal story. F., assumes that when telling one's narrative of persecution in front of case-officers, protection seekers must adjust their stories beforehand. He said:

> "When people come to me, full of fear and confusion when they get a negative, asking me "do we need to get a lawyer?"; I recommend that they have to clean up their stories and make it more realistic, more real… you see… rather than going confused to a lawyer […] lawyers do not always help you… sometimes lawyers receive instructions from the Commission asking them to report the false cases before they come to the interview […] Some lawyers collaborate and they defend their countries from fake asylum seekers".
> (F., an Iranian male 12 years in Italy, Marghera, May 2020)

Frej, who is known in his community as an asylum-knower say that it is important to keep one's experience underground and discreet. Tensions between visibilizing and in-visibilizing knowledge at one's disposal are often used to keep opaque intentions and plans, which would often raise suspicion towards protection seekers. Frej's testimony on lawyers being instructed by agents of the Commission to report counterfeit asylum seekers points out that the mistrust and suspicion is a two-way process. As protection seekers are often mistrusted, migrants also suspect lawyers who are deemed to support asylum seekers claims against the Commission denial. In this case, migrants make a tactical decision not to trust some formal actors and rely more and more on their peers to minimize the likelihood of suspicion and thus the denial of their claims.
Protection seekers must transform their lived experience into a consistent narrative of persecution, able to convey trustworthiness. Drawing on his knowledge of the EU asylum directives, F., emphasized further aspects to be considered when adjusting one's story. First, asylum claimants must perform 'victimhood' and dissimulate knowledge they have accumulated about the asylum procedures. Second, they must testify strong fears of persecution if they ever are sent back to their countries of origin, claiming thus that narrating ordeals of the journey through the sea to Europe and poverty back in their countries of origin is not sufficient to *make a good asylum case*; instead, protection seekers have to convince the judges that there is no authority to provide protection back home.
Indeed, protection seekers are assisted by informal actors in the asylum industry (peer migrants, interpreters, etc.) to gain awareness on the intricacies of asylum determination procedures in force. F., claims his capacity in influencing the choices taken by protection seekers through indicating relevant channels and information such as finding a 'less-strict' prefecture where case-officers are reputed to be 'flexible' with asylum seekers, adopting caution when interacting with formal actors, and spotting cities where asylum applicants are of a less number comparing to other places. Indeed, F., informs:

> "*To ask asylum and appeal your case you have to find a good city where there are few people applying for asylum and where there is a prefecture with less problems for the asylum seekers […] One mustn't seek the advice of lawyers… you cannot ask your lawyer "is it good if I say this or that". Don't forget that you don't pay money to that lawyer… the government does… they have connections with each other, they manage appointments for the interviews and modalities of the translation […] Lawyers and officials will not always do things to your favor*".
> (F., an Iranian male 12 years in Italy, Marghera, May 2020)

Indeed, the above-mentioned indications can be echoed in other migrants' testimonies on their quest to acquire legal protection. As S., depicts

> "*At first, they gave me nothing, they did not trust me […] after a long time going around Italy, I meet many people that told me what to do and how to do it… They also told me to go to Palermo… there you find where you sleep and stay untill you fix your problem… I won my case and I got three years, subsidiary protection. Listen… me and my brother were in the same place, we*

shared all the way to here... they gave him humanitarian for two years and me political (asylum) with three years. When we went to do the commission, I said my story and he said his story... We got different papers. With the commission, each one has his own destiny! [...] At first I told them my story with lots of confusion and fear and I was denied twice, Once I learned how to say it, I won my case. It's crazy."
(S., a Sudanese male 7 years in Italy, Mestre, February 2020)

Following the testimonies of the interlocutors, we can ruminate that asylum claimants are coerced by the guidelines in force to transform their fragmented trajectories into consistent narratives. They are conditioned to comply with the credibility determinants embodied in the Italian asylum procedures, where refugees are seen either as 'victims' and helpless or counterfeit. Notwithstanding the constraints that arise during the asylum determination, protection seeker's encounters with information on credibility determinants as framed in guidelines in force, allow them to build knowledge about ways to adjust their fragmented personal experience and maneuver their stories to match the constitutive criteria of credibility.
If we look at credibility assessment and recognize the various practices of assessment as forms of reaction to what is deemed to be 'counterfeit' asylum seekers, we apprehend that subjecting asylum seekers to processes of surveillance render migrants manageable and forced to comply with practices into force. In fact, the various practices of credibility evaluation seem to introduce an interstice upon which protection seekers act to certify their eligibility through reshaping a fragmented personal story into narratives conveying their need for protection. Despite the fact that these bureaucratic practices are often deployed to reverse access to legal protection to those framed as 'counterfeit', these filtration practices create a counter-productive effect; they are the ground on which tactics of protection seekers develop. In fact, when claimants are aware of the 'suspicion' culture in circulation among case-officers they tend to narrate their stories in detail, mentioning places and spaces crossed, avoiding any suspicion that could arise at the case-officer when interrogating the claimants about events, places, contexts all along the journey to Italy. F., insisted that these elements are to be considered when adjusting one's story of persecution in order to confirm the guidelines in circulation and the images of refugees as victims of war and persecutions (Fassin *et al*. 2010).
The underlined occurrences testified by migrants highlights the importance of taking into account the heterogeneous actors involved in the quest for legal protection deployed by protection seekers and their ways in acting upon this quest both from inside and outside bureaucratic and administrative institutions. Encounters with peer migrants, former asylum seekers, interpreters, social assistants indicate ways places, people and knowledge can shape the access to asylum procedures, appeals and eventually access to legal protection. These dynamics (re) construct relationships between formal and informal actors through the ways each take position and act on procedures, criteria, and images in circulation. Therefore, even against the various forces deployed to curve the access to legal protection migrants find their ways to adapt to the power deployed by asylum determination and open interstices in the sphere of assistance and legality. Overall, practices behind restoring stories of persecution must not be understood here as an 'invention' of persecution; rather they are modalities through which a fragmented personal story is resumed and redressed-to-match the credibility determinants. Only when this match is maneuvered, protection seekers make a good case and find ways to access the channels of legal protection.
Now, to conclude these testimonies, a quick consideration on the *right to opacity* and the right to not be understood on the institutional (Khosravi, 2018; Cabot, 2019) is strongly required. While some will urge to make visible strategies and tactics of migrants in coercive context either to romanticize their agency or to illustrate ways they circumvent power structures, we call for taking a step back and reconsider the over-visibilization and the over-accounting of migrants' everyday life. This is to say that when generating narratives and testimonies about social realities of the *subalterns*, one shall moderate the urge to document and write about tactics making it possible

for these subjects to survive a hostile environment. As far as the processes shaping credible narratives of persecution are concerned here, we choose to moderate the academic temptation to reveal what is kept underground. The reason is that we should not forget that often the academic work intersects with the industries of migration management. In this mountain hostile environment against illegalized migrants, researchers shall be concerned with the potential representation of the subjects of research outside the academic field. When we account the way some racialized people navigate legal statuses and the ways they use resources at their disposal, what echoes could that make in a context with a mounting suspicion on protection seekers? To mitigate the risks, we attempt to keep opaque the operational modalities in shaping a credible narrative. If the data collected stemmed from the invitation people provided us to enter their world, this means remaining loyal to the implicit conventions of alliance developed through the fieldwork; to the empathy we developed and the privacy to which the interlocutors have testified. With that being said, the narratives of the interlocutors are rather a moon-pointing finger to underscore the mounting suspicion on 'counterfeit' asylum seekers and ways they (re)invent and (re)shape narratives of the asylum-seeking-self. The interest here is not exposing details about their tactics in undergoing a hostile asylum system, but rather to underline the structural constraints triggering their resourcefulness in overcoming illegalization.

Building legitimacy

In a context where the legitimacy of asylum is more and more in decline (Fassin *et al.* 2007a) we tend to witness more suspicions framing protection seekers as 'counterfeit' (De Genova, 2013). State agents in charge of asylum cases slip into the more or less conscious role of the "moral entrepreneur" (Becker, 1963), to justify discretionary power (Becker, 2022), to justify the state discretionary power. Indeed, it is based on lack of credibility that the interlocutors were denied protection upon the first stance. The claimant must find the right story, and the state agent must explore the "grammar of actions" (Boltanski *et al*. 1991b) and of the story, i.e., the type of rules through which the claimant justifies and constructs a socially and admirably acceptable narrative. However, the fear of deportation and the long wait in structures of asylum operate as factors driving the subjects to navigate circuits of assistance so to challenge the denial of their asylum claims. The encounters with the « facilitators of asylum » are often rewarded with information, building thus know-how on restoring one's narratives of persecutions in accordance with credibility criteria in force. Telling the 'good' story is always sought by the interlocutors when encountered with credibility-based examinations deployed by caseworkers upon the substantive interview. The claims of asylum in this context are in fact stories grounded on events that happened in the past (Cabot, 2014: 113), in other contexts, other social realities, other countries than the country where the asylum is claimed. The fear of persecution is hardly to be justified by documented evidence (Shuman *et al*. 2010). Accordingly, the narrated stories of sufferance and its coherence, play a crucial role in conveying claimants' eligibility to a given form of protection. In her work on the formation of persecution narratives, Puumala (Puumala *et al*. 2017) has shown how this narrative takes shape in a dynamic space where verbal and nonverbal means of communication intersect to draw ways to the interpretation, the transcription, and the evaluation of the narrative of persecution. The multimodality of conveying one's narrative of persecution allows us to understand how protection seekers make persecution more legible.

Information in circulation about the figures assigned to protection seekers (Fassin, 2007), and credibility assessment criteria in force allow a window of opportunity for asylum seekers and their supporters to challenge the filtration practices ranging these subjects in term of countries of origin and type of lived ordeals without consideration to individual cases. Thus, protection seekers adopt, adapt, and restore their narratives aspiring to reverse the denial judgment and open an interstice in the space of eligibility.

The emerging literature on bureaucratic practices in asylum determination procedures has underscored the capability of judges (Kobelinsky, 2018; Sorgoni, 2018), caseworkers (Affolter, 2019) and administrators (Gibb, 2019) to act and influence the processes of credibility assessment, shaping thus the practice of formal regulations. Notwithstanding the importance of these reflections, protection seekers themselves and their capability to act on credibility assessment has remained little researched, often compensated by examinations to formal actors' practices. As we explore testimonies of migrants, we gain sight that protection seekers themselves can also play a crucial role in acting on the course of the formation of credibility determinants. The interaction between *migrants-bearers-of-information*, as shown above, allows sight into the importance of weaving connection with other migrants previously experienced with similar conditions. People to meet, information to gather, and circuits to cross form paths for a circumscribed agency (Cabot, 2014) bounded by the encounters with facilitators of asylum (peer refugees, migrants, interpreters, lawyers, and social workers). By navigating assistance and the bureaucratic practices of asylum determination in Italy, Sub-Saharan protection seekers shape their know-how on ways to deal with bureaucratic intricacies. « The strategies of navigation, therefore, enable migrants to achieve their objective [...] However, migrants' experiences, notwithstanding their legal situations or how long one spent in the country, remain characterized by precarity and temporariness » (Tuckett, 2015, 124). Unlike many protection seekers who unsuccessfully navigated the bureaucratic labyrinth of the Italian asylum determination machine, and thus caught in illegality, the Sub-Saharan refugees who participated in this research were able to obtain a certain level of assistance and collect information on the institutional environment, its inconsistency, its elasticity, and thus have gained an interstice in legal protection.

Disciplining the migration process through testimony's credibility

The bureaucratic process aims to; to quote Judith Butler on gender (Butler, 1990), discipline the migrant's identity through a set of practices and justification. However, this disciplinary process seeks to subvert the migrant's identity through new *ways of knowing* (Hogan and Pink, 2010). This gives the migrant the opportunity to explore other modalities of inversion of the self and the experience of sufferance. The migrant enters a new birth process; entering «a machinery of power that searches, disarticulates and recomposes him» (Foucault 1975, 139). This «political anatomy» defines how the migrant must justify his ordeal and access to legality. It is through the testimony of persecution that a new migrant in born, or in the process of being so. The bureaucratic process of asylum determination disciplines migrants to procedures to make them docile, in performance within the power. It is through the process of certifying one's ordeals that the migrant engages in a relationship with the bureaucratic system, the asylum system and the society in general.

Indeed, the testimony appears as a matter of public concern (Chua *et al.* 2021). It is a means of reflexivity for the anthropologist, as it is for the witness. However, it is difficult to lump all categories that lend themselves to testifying together. Migrants, as figures of the margin, are excluded from this testimony as public interest. Here, we mobilize the concept of the margin as a space of in-between, where the margin is a space of life in which actors question the official discourse on migration and challenge their exclusion. It is a different way of understanding society, a form of otherness, a reflection of non-conformism. By its non-conformism, the margin marks its own borders of practice, giving the possibility to its members to assert their identity according to their affiliation to the world as migrants who must justify and prove their suffering.

The legitimacy of asylum does not depend on the law only, but also on the involvement of the facilitators and controllers of the access to legal paths of migration. Social workers and bureaucrats, as they can appreciate or not the testimony, come together to shape and transform the testimony of one's eligibility to legal protection. The migrant in this case is not an object of right,

he occupies a non-right sphere, and he is primarily excluded through processes of suspicion and illegalization. It is through the performance of personal truth and testifying on sufferance that the migrant can break out of the non-right sphere and gain access to legal protection. By collecting testimonies, the anthropologist becomes an element of this chain of evidence and becomes a witness to the migrant's suffering and ordeals. Thus, we raise the question, what could migrants' claims to truth contribute to the production of anthropological knowledge?

Our work shows how the actors fabricate their past and present through testimonies. Beyond the issue of truthfulness and falsification, the actors starve to respond to the demands of the bureaucratic machine. By testifying for oneself, the migrants produce a counter-truth to that circulating in anti-migrants' political discourses, which accuses migrants of evading Europe. These occurrences underscore ways truths are produced, articulated and evaluated; and how migrants construct their own counter-truths and self-staging narratives, with the aim of transforming the point of view of the structures involved in the asylum system. Rather than simply involving the revelation or restitution of a truth, the testimony challenges and produces a specific type(s) of truth. It is primarily about producing evidence, whether it is forensic, expert, or traumatic experience (Scott, 1991). This leads to the idea that «the capacity to witness is not innate or automatic, but often the outcome of one or more transformation(s) » (Chua *et al*. 2021: 11).

When working on the testimony of migrants, we notice that the discourse of migrants changes along their journey. In other studies, in Morocco (Mouna *et al*. 2018; Kchikach *et al.* 2020), we note that migrants denunciate the connivance of European policies with authoritarian regimes in Africa. This discourse changes to give way to individual justification, to the path of suffering, when they arrive in Europe. We are therefore far from seeking the truth produced by the testimony, but rather how it is generated from a necessity, and inscribed in a changing space-time. Notwithstanding the testimony seeks to achieve its formal objectives in terms of bureaucracy, whether in Morocco or in Italy, the testifying subjects only accepts to testify when they are reassured of our empathic position; as we have lived a migratory journey as well (France, Italy), which for them is important to understand their story. This is a testimony that goes through a network circuit, and we provoked it by the trust established with these migrants, because as it has been underlined before, the testimony is not an innate behavior, it is an acquisition.

Being a witness depends on the double transformation of narrator (witness/victim) and documenter (NGO/defender) (Chua and Grinberg, 2021). However, this transformation and the subject positions with the testimony can change; our interlocutors choose the place of our encounter, forced us not to see anything else besides the circumstances they wanted to expose. Here, emerges the role of researcher in producing and shaping the testimony. The testimony is a long process, in which the migrant makes sure of the reliability of our approach, asks questions about our purpose, our links with the authorities. As the encounters are multiplied, the testimony takes a form of confidence. We sought to engage in a cautious relation without making our interlocutors feel any pressure from us. It is a matter of producing a different context from the one which the migrant produces a testimony in front of the authorities. This means giving the interlocutors the choice of time, space and duration of their testimony.

At last, the fieldwork is a form of invisible theater where the researcher and his interlocutor keep changing and reversing roles, each one "acts" and "observes" where the intentions of those who testify can remain invisible to us (Castañeda, 2006a: 82). The testimony of the migrants cannot be reduced to transfigured expression, but it must be « the result of a hermeneutic work developed by the people themselves and thereby analyze the way they were constructed, negotiated or contested in an incessant work of determining the meaning of the action » (Boltanski, 2002a 282). Thus, our make explicit the categories, the rules of justice put forward by the actors to give reason to the action of migration and asylum.

In front of a commission's representative, the migrant must have two types of stories to tell, either the story that begins with because or because of, he or she must emphasize the necessity and urgency of his or her migration, which may be linked to war, genocide, natural disaster... these

are the good migrants, because certain death awaited them. Unlike the good migrant, the use of for and in order to transform the migrant into a suspect, leaving his country to improve his living conditions, and in order to live a new adventure and fulfill himself, is not something allowed to people from the South, they are bad migrants. This situation is described by Mohamed Mbougar Sarr in his novel Silence du Chœur, about the arrival of migrants in southern Italy. For Mohamed Mbougar Sarr, a good migrant is one who is in the process of becoming an almost dead migrant, one who has a breath left to tell us why he left. Recognizing a migrant's suffering through his testimony is like granting him a diploma, as Mohamed Mbougar Sarr rightly puts it, "Migrant is a form of diploma that has to be earned, with different mentions, the most prestigious of which is: " almost died for real " (Mbougar Sarr, 2022: 184). It is in this perspective that the migrant adjusts his testimony to fit the image of administration, replacing the desire to live a better life with that of suffering and victimization, in order to increase the probability of a successful testimony.

Conclusion

The article has focused on the praxis of credibility assessment with respect to its connections to protection seekers' tactical maneuvering in certifying their sufferance and fears of persecutions upon the substantive interview. Far from reinforcing the victimization of protection seekers and the primacy of the bureaucratic practices, our argument has drawn attention to diverse expressions of the certification and the approval of credibility, highlighting also the capacity of protection seekers to act on credibility determinants upon asylum determination procedures. We have argued that the practice of credibility assessment in Italian asylum determination procedures exerts power on migrants through classifying, naming, and ranging them in general categories such as 'comers from safe countries of origin'. Such proliferation of categories and criteria compels people to adopt and adapt more or less calculated tactics about how to configure their images and testimonies in order to match constitutive credibility determinants in the Italian asylum regime and open interstice in legality. On the same line, agency of protection seekers is susceptible to be shaped according to encounters with bearers of information on the Italian asylum system.

The analysis of Sub-Saharan protection seekers' quest for credibility certification has gained insights from and contributed to critical analysis on asylum determination procedures, participating thereby in underlining the placement of asylum seekers themselves in acting on credibility determinants. Although asylum determination have been conceived as extremely bureaucratic and shaped by law doctrines, practices observed in the field have underscored the implementation gap between determinants as written and their practice on the ground. This case study underscored ways actors concerned with asylum determination tend to operate with the system, shape the system and even create interstices inside the system. Credibility determinants are not only a sum of systematic and doctrinal criteria governed by intact regulation; they are rather implemented by subjects often bringing their personal apprehension of credibility and truthfulness. Credibility assessment as practiced refer to different forms of (re)definition of asylum determination procedures. In our sense, inquiring on asylum determination procedures require a strong consideration of the private speech of both formal and non-formal actors. As shown above, collecting testimonies *of* and *on* different actors' practices allows grasping actions, discourses, and representations that shape the course of asylum procedures, nuancing thus the doctrinal understanding of the asylum procedures.

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Rocco Scolozzi[1]

"If it happens again I'm leaving": suggestions for risk communication from a field study of communities in Basilicata, Italy[2]

1. Introduction

The processes of depopulation, with their causes, consequences, and transformations, roughly follow similar patterns (Rao, 2012). Communities develop, expand and maintain themselves through successive transformations or decline on the basis of mainly endogenous processes (Forrester, 1982). In many cases, a disastrous natural event, often accelerated by poor maintenance or overexploitation of ecosystems or local resources, can contribute to the abandonment of a territory, more rarely the single event, however dramatic, alone determines the decline of a community. "Where the population is strong, it is able to resist even disaster, trying, as far as possible, to remain stubbornly settled in its places of origin" (translation from Scamardi, 2020, p. 30).

A community is resilient when it proves capable of handling and adapting to a shock, such as an adverse natural events (e.g. earthquake, landslide, debris flow), particularly to the extent that its members are interconnected and work together to be able to

- sustain critical systems (health, communications, accessibility, economic activities) even under stress;
- increase self-sufficiency in the case of limited or temporarily interrupted external resources;
- learn from experience to improve resilience as a community, speeding up recovery, adapting to environmental, social and economic changes, without losing community identity[3].

Such capacities at the community level are sustained over time by a number of variables, such as: widespread perception of risks, reciprocity and trust between citizens and between citizens and institutions, available resources (human and material), and the collective preparation and application of effective behaviour. Other examples of social variables identified as important for the resilience of social-ecological systems include: vision, leadership and trust (Folke, 2003); the ability to monitor and respond to environmental feedback (Folke, 2003); development of social networks (Folke, 2003; Lebel et al, 2006); sharing of various sources of information and knowledge through these networks (Berkes & Turner, 2006; Folke, 2003); governance, which includes participation, representation, deliberation, accountability, empowerment, social justice (Lebel et al., 2006) and, finally, the existence of collaborative and social learning "arenas" (Pahl-Wostl et al., 2013; Reed et al., 2010). Community resilience can be considered an ecological, technical and social, local and political process (understood as the concertation of operational frameworks and visions).

According to Cyrulnik, cultivating resilience implies helping individuals to recognise and develop their skills and resources to deal with a traumatic event, as well as influencing the local culture. This can be pursued by involving the family, community, and health, educational, political and economic systems, in a positive reorganisation that values differences in all their forms, and which are indispensable for the overall improvement of society (Cyrulnik & Malaguti, 2005). Accordingly, it becomes imperative to systematically examine the vulnerabilities of individuals, communities, and the socio-economic systems they are integrated into, alongside assessing the resilience of technological systems.

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2 Received: 27/02/23. Revised: 18/10/23. Accepted: 30/10/23. Published: 30/10/2023.
3 Koliou, M, van de Lindt, J.W., McAllister, T.P., Ellingwood, B.R., Dillard, M, & Cutler H. (2018): State of the research in community resilience: progress and challenges, *Sustainable and Resilient Infrastructure*. 5)3), 131-151. https://doi.org/10.1080/23789689.2017.1418547

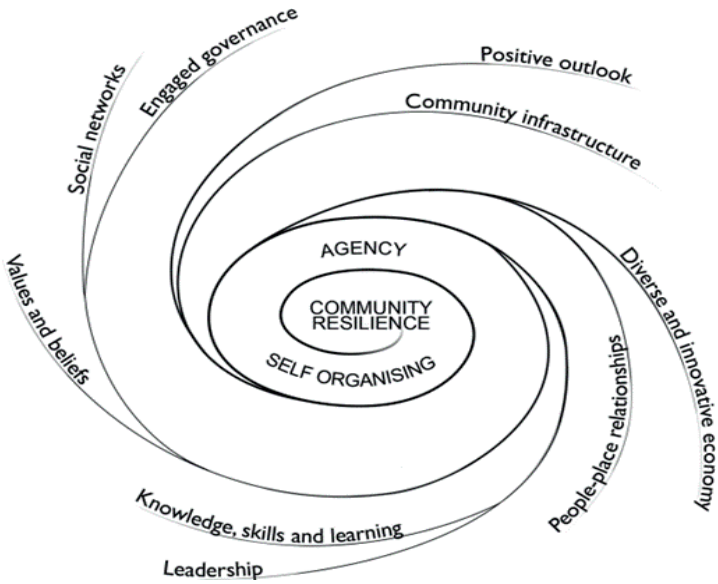

Figure 1 Community resilience as an interaction of individuals, community and administrative processes (from Berkes & Ross, 2013).

1.1. Risk communication as dialogic process

Risk communication plays a crucial role in shock preparation, i.e. before the event. On the other hand, we live in a "risk society" (an original term *Risikogesellschaft* proposed by the sociologist Ulrich Beck[4]) where access to information is considered a right of citizenship and where the ability to deal with threats to which we are exposed may depend on the cooperation of the community. From this emerges the importance of trust between citizens and institutions: without trust, any risk communication loses effectiveness, with potentially negative effects on the security of that community.

Given the importance of risk communication entire fields of applied research have emerged recently such as "risk communication" and "risk analysis", which have matured since the 1980s and in which certain principles have been defined and consolidated that should be part of the cultural heritage of public administration. These recent developments offer alternatives the "deficit model" of risk communication, widespread since the 1970s, in which it is assumed that controversies about risks (e.g. on the actual hazard, on technical analyses) are attributable to the "cultural deficit" of the public, which, supposed ignorant of science, is incapable of protecting itself from dangers or of correctly understanding risks. According to this model, an appropriate provision of information (or effective education) would be sufficient to change behaviour and choices. In this paradigm, experts are the bearers of objective and unquestionable knowledge, because this knowledge is quantified with mathematical approaches, while the public is a passive and homogeneous recipient subject (Sturloni, 2018).

The sociocultural theory of risk (or *Cultural Theory*), proposed by anthropologist Mary Douglas (Douglas, 1992), replaced the deficit model, proposing to overcome the rigid determinism of technical and engineering approaches by considering the importance of culture (or rather cultures) in understanding how communities shape social responses to hazards. In this model, risk acceptance and risk decisions depend on a process of social negotiation, codified and shared through local culture (Steg & Sievers, 2000).

4 Wimmer, J., & Quandt, T. (2007). Living in the risk society-An interview with Ulrich Beck. *Journalism Studies,* 7(2), 336-347. https://doi.org/10.1080/14616700600645461.

More recently, the social *amplification* theory *(social amplification of risk framework* or SARF) has been proposed. This is an interdisciplinary approach that aims to understand and explain in greater depth the reasons why certain types of risky events, although evaluated by experts as unimportant or extremely geographically circumscribed, become extremely meaningful for society, while other types of events, evaluated as serious by the same experts, attract not only little concern but also little attention from the media and the public (Kasperson et al., 1988).
The term "risk communication" implies a dialogic relationship between active and interdependent actors and differs from the simple distribution of information. Only a dialogue, continuous over time, can *"contribute to the building of that relationship of trust and collaboration between citizens, experts and institutions that is considered indispensable for a shared management of risks of natural or anthropic origin. Specifically, risk communication has the primary task of facilitating the sharing of information necessary to favour conscious choices to protect individual and collective safety"* (Sturloni, 2018, p. 56). In the context of hydrogeological risk, communication has been recognised as having the capacity to raise awareness, affect behaviour and ultimately improve the responsiveness of communities to reduce damage and save lives (Charriere et al., 2012).
Effective communication is based on two factors: the functionality of the message and the quality of the relationship between the interlocutors. Information alone, understood as the distribution of information to abstract recipients, risks losing the necessary relationship with the recipient, and thus risks being ignored. In this paradigm, the public, the recipient of risk communication, is recognised as an active player and as a possible *partner* in risk management.
In peacetime, public participation in risk management is necessary for its effectiveness, especially where decisions have to be made in situations of uncertainty and where technical knowledge is insufficient to indicate an unambiguous solution. The impossibility of acquiring perfect knowledge and total control of risks and the resulting uncertainty "places democracy at the heart of decision-making" (Ungaro, 2004, p. 105).
In an emergency, public trust in institutions is essential; people are at their best when they can face a difficult situation together. However, the situation becomes more complicated if they begin to perceive that they are being manipulated or deceived, and if they feel that things are not being told to them as they are. This is precisely the situation in which attitudes of panic or denial are most likely to arise, leading people to ignore any instruction or develop paranoid assumptions (World Health Organization, 2013).
From the above, it emerges that planning risk communication processes and prioritising interventions effectively are crucial, including:

- knowing the profile of the recipients to whom the communication is addressed
- defining the objectives to be achieved
- choosing the most appropriate messages
- identifying the most suitable communication channels to reach the target audience.

Regard the profile of recipients, this study explored some representative communities of small municipalities in the inland areas of Basilicata (and southern Italy in general), characterised by a much higher rating on the old-age index than the national population, and affected by landslides and earthquakes, lack of services, mobility difficulties and depopulation phenomena.
With regard to objectives and channels, it is crucial to distinguish between strategies and the timing of the expected effects to avoid creating unrealistic expectations or for commitment to fall away time. In particular, we distinguish three categories of objectives (or situations) with different corresponding strategies:

- prevention: motivating people exposed to a known risk to change their behaviour, here it is relevant to offer available alternatives;
- emergency: making people aware of an imminent risk in order to encourage responsible self-protection behaviour to safeguard their own safety and that of their loved ones, here training in appropriate reactions is crucial;
- dispute management (pre- and post-event): facilitating discussions between the parties on

the nature of the hazard, damage management, and anticipatory risk governance, where it is essential to replace the decide-announce-defend (DAD) model with a share-open-negotiate (SON) model.

These elements constituted the theoretical context for the applied research questions, defined around the objective of providing operational indications (rather than sociological and theoretical knowledge) for risk communication in support of community resilience, such as: identifying how the members of the fragile communities studied perceive and are informed about natural hazards, the levels of reciprocity and trust in institutions, and the relevant differences between communities in terms of knowledge, trust, exposure and preparedness.

2. Methodology

Based on these premises, a questionnaire including 16 questions (see Appendix) was designed, tested and applied in a survey to collect qualitative information on different variables and to compare different social groups. In this regard, the gender, age group, educational qualification and municipality of residence were asked. In addition, the respondents were asked to describe themselves (question Q1) through one of the following five occupation categories:

- Administrator or civil servant
- Professional with local business activities
- Member of local association or group
- Student or teacher
- Citizen (not falling under the above cases)

The purpose of this description was not obtain an exact sociological classification but an exploratory attempt to ascertain whether groups that relate in necessarily different ways to natural hazards show indications of different knowledge, perceptions and attitudes. Any differences can be translated into "customised" indications suitable for each type of interlocutor.

Questions Q2 and Q3 were used to check for differences in the number of people in the settlements during the day, distinguishing weekdays from public holidays and six time slots (00-06:00, 06:00-08:00, 08:00-12:00, 12:00-16:00, 16:00-20:00, 20:00-00:00). These differences may be important for estimating the number of people exposed at different times (Lutoff et al., 2016).

Questions Q4 and Q5 aim to obtain information on commuting, related travel times and means of transport used, and on motivations and travel times for other trips. Motivations and travel times constitute crucial information for the design or management of the local road network in the case of emergencies, but also for warning systems (Ryan, 2018).

Questions Q6 to Q10 concern knowledge and perceptions of risks and their consequences. In particular, these questions aim to assess possible differences in the perceived importance of an event, the estimated probability of its occurrence, the imagined impact on the local economy and the possible contribution to emigration. taking inspiration from a previous study (Wagner, 2007).

This information is relevant for imagining evolutionary scenarios of the community based on the risks as currently perceived and the "demand" or perceived need for local interventions aimed at reducing these risks that could mitigate demographic decline (Franceschinis et al., 2021).

Question Q11 investigates opinions on actions considered effective in improving community preparedness for disaster events. Similarly, questions Q12 and Q13 investigate preparedness (knowledge and actions) but at an individual level. The purpose of question Q14 is to distinguish between citizens with and without rescue experience and to be able to check for differences in how they respond to the other questions.

Questions Q15 and Q16 are derived from a previous study (LIFE FRANCA project[5]) and concern

5 https://www.lifefranca.eu/it/.

social ties within communities and individual trust in institutions. For Q15, values around 4 means that the community is made up of people who are likely to be alone or without support in the event of a disaster, the opposite of a cohesive community and therefore not very resilient. For Q16, values around 4 mean that the respondent does not fully trust the mayor (representative of public institutions) with possible different interpretations of the situation; in the event of a disaster, this could be an impediment to coordinated and effective management of the emergency.

2.1. The study area: the selected municipalities

The study area comprises four small municipalities in the province of Potenza (Albano di Lucania, Campomaggiore, Castelmezzano, Pietrapertosa), which have similar population size. Their characteristics are summarised in Table 1.

Table 1 Main demographic indicators of the four communities and at national level (source ISTAT)

Indicator (data as at 01.01.2021)	Albano di L.	Campomaggiore	Castelmezzano	Pietrapertosa	Italy	Basilicata
Average age (years)	46.4	49	51.3	50.1	45.9	46.5
Mortality index	11.7	13	14.6	14.8	12.5	12.2
Replacement index	167.9	152.4	225	191.7	138.1	146.5
Women in %	48.8%	50.9%	51.3 %	52.4 %	51.3 %	50.8
Population	1369	746	744	945	59,236,213	545,120

It is interesting that all four municipalities have a higher average age and a greater replacement index (ratio between the number of 60-64 year old people and 15-19 year old ones) compared to the Italian average. Increasingly older communities with fewer young people could face a number of problems in the coming years regarding the management of natural disasters, perhaps not yet visible today.

2.2. Sampling and the sample

Sampling followed the so-called 'opportunity approach', inviting mayors, some local associations and residents involved in other MITIGO project activities to disseminate the questionnaire to their fellow citizens, seeking maximum heterogeneity. As they are small communities, this collaboration made it possible to collect a fairly diverse sample with overall statistical significance. The sum of the number of inhabitants in the four municipalities at the age considered relevant for the questionnaire (i.e. excluding people under 14 or over 75) is 2866. Therefore, according to Slovins' formula, the sample (167 questionnaires) allows a statistical margin of error in terms of a confidence interval of 7%. This is equivalent to saying that if 47% of respondents in the sample answered "yes" o a certain question, the percentage of people who would answer "yes" in a survey of the entire population would be between 40% and 54%. This approximation is considered acceptable, considering the qualitative nature of the questions and the processes (social and individual) that are being explored.
In addition to descriptive statistics, the assessment of any statistical differences between the groups was carried out using the χ^2 Test for contingency tables or non-parametric ANOVA (with tests such as Kruskall-Wallis).

3. Results

3.1. People at home on weekdays and holidays (Q2, Q3)

As is expected, given commuting patterns, the questionnaires show a substantial difference between holidays and weekdays in the number of people at home. In the morning (time 08:00-12:00) the difference exceeds 100%, in the afternoon it is limited to around 50%.
It is interesting to note the statistically significant difference (ANOVA, $p<0.001$) between the municipalities for public holidays and for almost all times. This information concerns the dynamics of the exposure of the local population and could help to calibrate and differentiate communications in the event of a disaster or alert, considering the time, whether a working day or holiday, and the specific community.

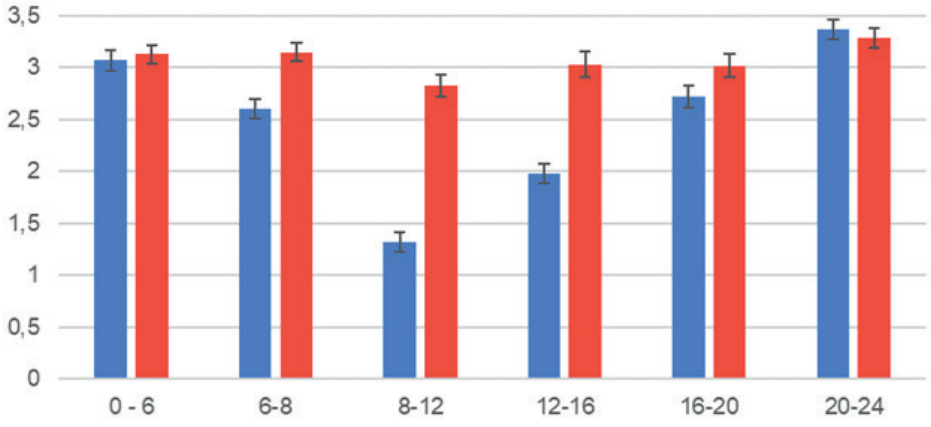

Figure 2 Number of people generally at home at different times, on holidays (red) and working days (blue).

3.2. Commuting characteristics (Q4 and Q5)

Most residents appear to commute (54%) by private cars (60% of respondents). Most of their commuting trips take less than 60 minutes and are for work or study reasons, followed by other reasons such as shopping, health services and leisure.
The commuting rate varies significantly between categories of occupation and between municipalities (ANOVA, with $p < .001$), while occupation category (Q1) and age significantly differentiate between public and private transport use.

3.3. Perception of risks (Q6, Q7)

All the respondents consider natural hazards to be a real danger for their locality, almost all agree that these could jeopardise their activities and that the frequency of disaster events will increase in the coming years. About two thirds of the sample believe that structural interventions can reduce these risks and at the same time they believe that the population in general has few tools and little awareness to deal with them.
Most of the people interviewed consider it certain or at least probable that an earthquake, landslide, fire or interruption of utilities will occur in the next 10 years; but it is interesting that 20% do not consider the occurrence of an earthquake to be probable, despite the fact that all four municipalities fall within seismic zone type 2 (medium-high risk). A singular aspect is that the expected probability of an earthquake varies significantly between municipalities (considered

less likely by residents of Pietrapertosa than those of Albano). On the other hand, more than 20% of respondents do not consider the risk of wildfires to be important, despite the fact that in every municipality there are areas at high risk and affected by wildfires in the last 15 years.

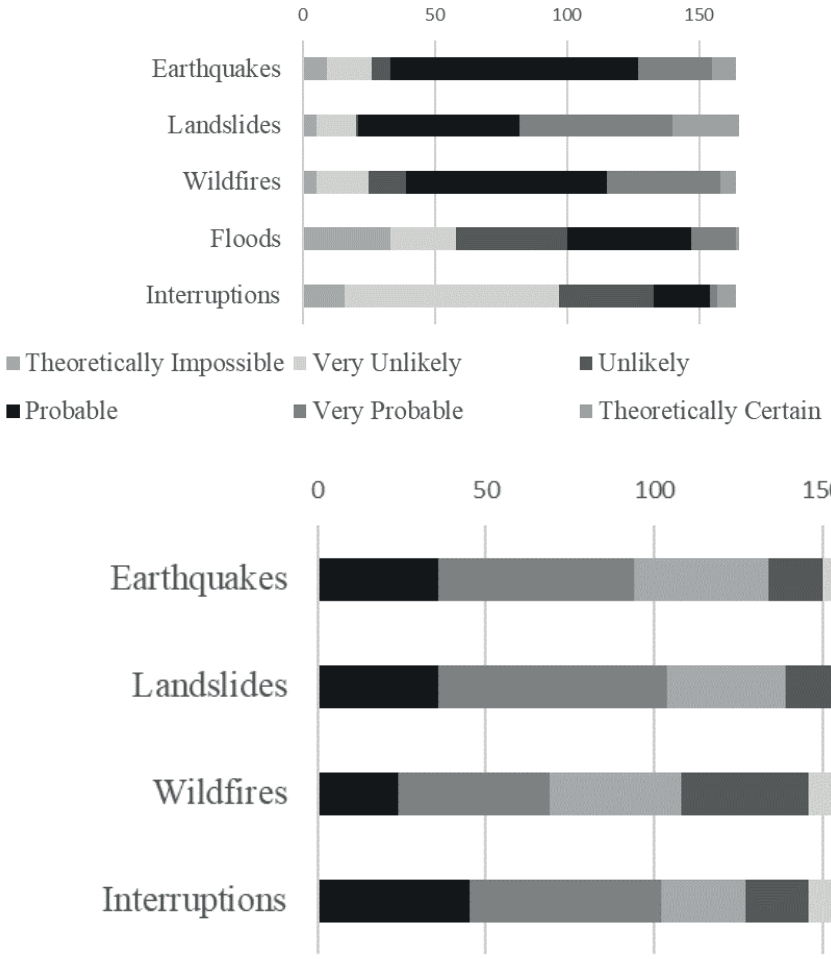

Figure 3 Probability estimates of disaster events and related perceived relevance as a reason for leaving the locality/emigrating, moving home and relocating/leaving a business..

In comparing the groups, it is interesting to note the different responses from those who are rescue volunteers (or have had rescue experience) and those who say they have no experience, to the statement "the population generally has few tools and little awareness for dealing with natural hazards" (Q6.5): it is more common for those who provide rescue or have had rescue experience to consider the population to be less prepared than other groups.

3.4. Expected consequences on the community of disaster events (Q8, Q9, Q10)

According to the sample, events such as earthquakes, landslides and disruptions of utilities could have an impact on the community in terms of less willingness to stay and live and work in the locality. In the event of a disaster, the immediate consequences would mainly concern the disruption to the road network and services, with damage to businesses and property. Of the

various consequences of a disaster event in the long term, the contribution to emigration seems the most feared.

3.5. Disaster preparedness (Q11, Q12, Q13, Q14)

Regarding which actions could improve the community's response and preparedness for disaster events (among those listed) no important differences emerge; among the most selected are mapping risks, and carrying out new works, while the least selected are training for public administrators and technicians and for companies and professionals.
Concerning self-preparedness in the event of an earthquake, interestingly almost 20% of respondents would not know what to do, while 26% feel confident in their abilities because they keep themselves informed.

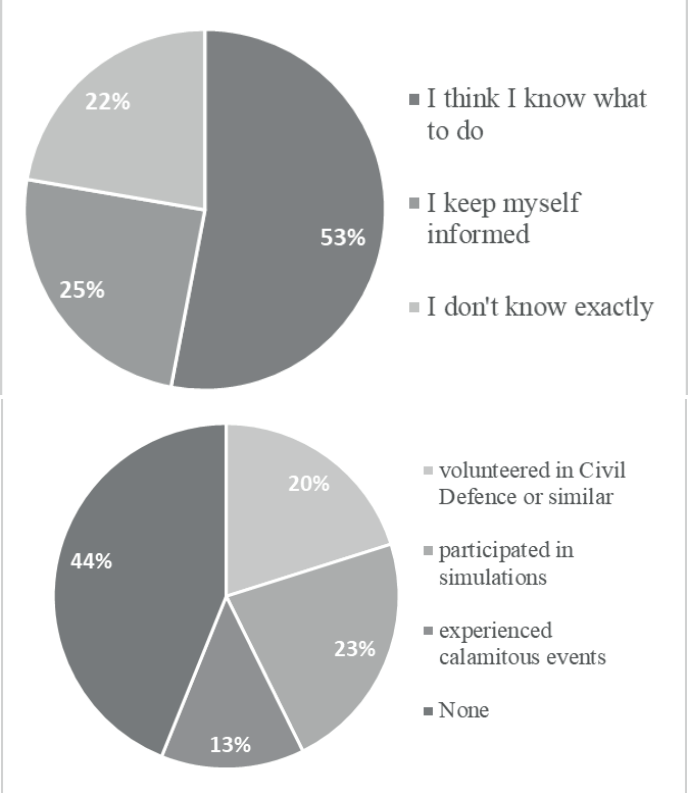

Figure 4 Distribution of answers to the questions "Would you know what to do personally during an earthquake?"(left), and "Do you have any experience of events, rescue or simulations?" (right).

At the community level, more than 40% of the respondents have no experience of disaster or rescue events, at the same time one fifth of them are or have been rescue volunteers or have participated in simulations. In this respect, an interesting gender difference emerges: women are more frequently rescue volunteers than men.

3.6. Ease of shelter and readiness for evacuation (Q15, Q16)

If evacuation to escape danger was necessary tonight, only 30% of respondents would have no difficulty in finding temporary accommodation (e.g. from relatives, neighbours, etc.), while 40% would have considerable difficulties.

If the mayor gave a warning to evacuate the locality, 36% would be willing to leave their homes immediately, while just over a third would only do so after assessing the situation for themselves.

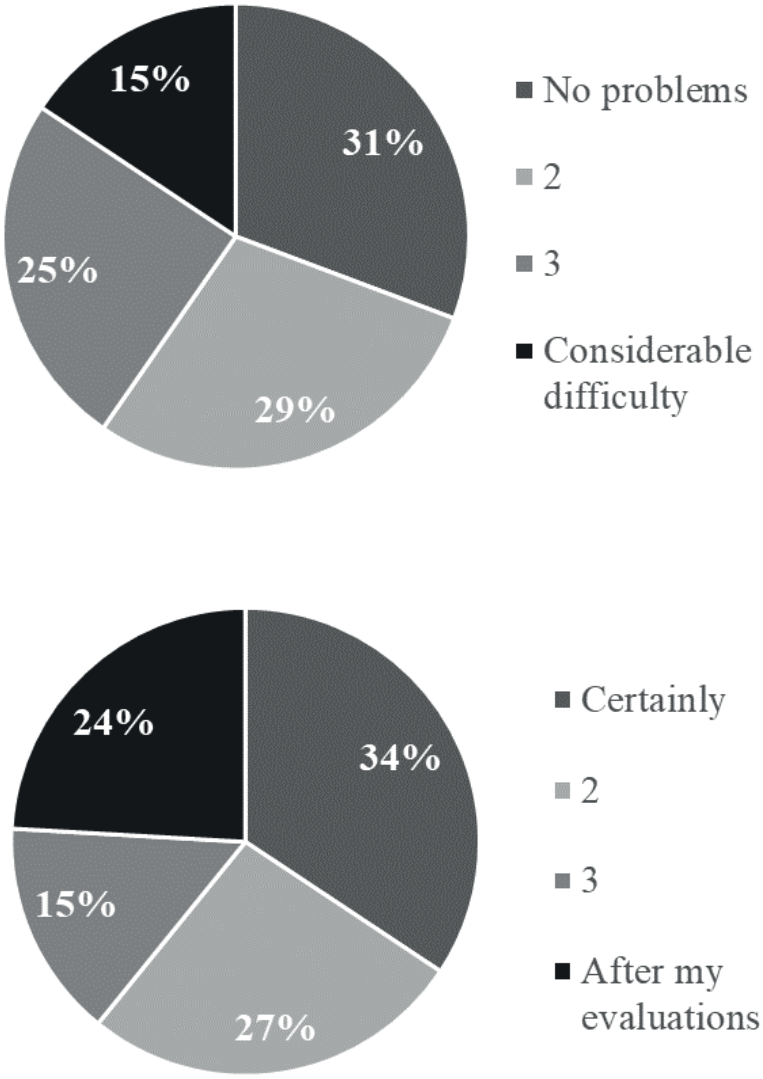

Figure 5 Possible difficulty in finding shelter (left) and readiness to evacuate in an emergency (right).

In the answers on willingness to evacuate, a significant difference emerges between the four municipalities, in particular, in Castelmezzano, citizens seem significantly more likely to follow the mayor's instructions than in Campomaggiore.

*Table 2 Statistical analysis of response differences between the groups by municipality, age group, gender, literacy, occupation category, rescue experience; only significant ones are reported (P < 0.05 or < 0.001 if marked with *).*

	Municipality	Age group	Gender	Literacy	Occupation Category (Q1)	Rescue Experience (Q14)

Q2	Q2.1, Q2.2, Q2.4, Q2.5, Q2.6					
Q3	Q3.1, Q3.2*, Q3.3, Q3.4, Q3.5, Q3.6					
Q4	Q4a*, Q4c	Q4c*			Q4a*, Q4c*	
Q5	Q5.1	Q5.3, Q5.4	Q5.3	Q5.2	Q5.4	
Q6						Q6.5*
Q7	Q7.1*, Q7.4*			Q7.5		
Q8	Q8.1*,Q8.3*			Q8.3		
Q9	Q9.1, Q9.2, Q94, Q9.5		Q9.3			
Q10						
Q11				Q11.5		
Q12				0.016		
Q13	Q13.1,Q13.2, Q13.4					
Q14	0.034		<0.001	0.025		
Q15						
Q16	0.021	0.019		0.036		
Q17	<0.001					0.059

4. Discussion: suggestions for risk communication from literature field study

Floods, earthquakes, and landslides, or more simply migrating to more convenient locations with easy access to services, activities and work, are the common reasons given for the sudden or gradual depopulation of many inland towns in Southern Italy; however beyond any single event, the endogenous processes and the characteristics of the community are what make it possible to withstand shocks and recover, perhaps evolving and learning from the experience.

From the literature review and the research we collected information of general interest and some practical implications, especially useful for setting up risk communication projects in the areas studied of Basilicata and in general in the inland areas of southern Italy and the Italian Apennines. Furthermore, the areas of Basilicata explored in this study could be a laboratory for the anticipation of what could happen in other "fragile commiunities", characterised by the disappearance of social cohesion and ageing populations, sometimes aggravated by the instability of ecosystems (e.g. due to increased drought or extreme weather events).

The overall long-term aim of any risk communication is to increase and sustain over time of community resilience, understood as the competence of the community to operate in critical systems (e.g. water, mobility, facilities) even under stress, increase its self-sufficiency, learn from experience to adapt to environmental and social change, and accelerate recovery times. These competencies depend on risk perception, reciprocity between citizens and trust in institutions, as well as on available resources (human and technological) and the collective preparation and application of effective behaviours. These can be only developed iteratively, by successive approximations through experiences or simulations, over a long period of time.

Therefore, each risk communication programme should be directed at one specific area of risk management at a time, such as *prevention, emergency,* or *recovery management*, in order to focus the available resources and attention on specific aspects and to facilitate understanding of the message. In addition to a specific scope, each communication project should make explicit the expected change, whether *cognitive*, *behavioural*, or *values,* in the target audience (e.g. young or elderly people, private or public organisations).

In practice, the risk communication team should ask themselves what they want the recipient to know, do or value as important (or unacceptable) regarding specific aspects of risk. On the basis of thin information, it will be easier to define realistic indicators of success and expectations based on the time required for each type of change. On the other hand, the expected change should refer to the status quo of the specific community (not of a general, geographically vague "public"). Therefore, it is essential to collect data regarding the current or most widespread

knowledge, behaviour and values in the community of interest.
Concerning targets, communication methods should be inspired by a dialogue between specific actors, considering their capability to cope with or react to an event, and communities, considering their dynamics, in terms of commuting rates and means of travel. This dialogue should consist of a two-way exchange of information, building relationship based on trust. Information alone, understood as the distribution of information to abstract recipients, risks losing the necessary relationship with the recipient, and thus runs the risk of being ignored; without dialogue (or feedback), it is not even possible to assess the effectiveness of a communication (e.g. assess what has reached the recipients, or what changes it has promoted in their behaviour).
Recognising risk communication as dialogue means trying to understand the target audience (their knowledge, values and interests) and the relationships between the different social actors involved in risk management (between synergies or collaborations and possible conflicts). This dialogue should promote an anticipatory approach oriented to *strategic conversations* (Arnkill, 2019; Ratcliffe, 2002) between the different actors, in multi-centred contexts, not only exchanging information but also producing new knowledge about risk (no longer the monopoly of experts and technical institutions). In other words, it is a matter of conceiving risk communication in terms of sharing, exchange, confrontation and participation.
In this regard, it may be useful to consider some of the principles for building resilience of socio-ecological systems in risk management and communication (Boyd et al., 2015; Gallopín, 2006; Lebel et al., 2006). Strategies to increase the diversity and redundancy of resources and foster a polycentric approach to the management of local systems and connectivity could limit the negative and long-term consequences of natural disasters. Municipal contingency plans could be inspired by these principles (in part they already are) in a more systematic way and in synergy with public transport and road network management plans, which, being defined by different actors and in different locations, today hardly align with each other and with the locality.
The questionnaire tested in this study proved to be a useful source of information regarding these elements, obviously not exhaustive and limited in the level of complexity explored.
With regard to the profile of the recipients, this study explored a number of communities representative of the inland areas of Basilicata (and of southern Italy in general), characterised by an old-age index that is much higher than the national one, by landslides and earthquakes, lack of services, mobility difficulties and depopulation phenomena. From the questionnaire, whose sample approximately represents the four communities investigated (confidence interval of ±7%), some specific points emerged regarding the above-mentioned issues.
The segmentation of target audiences and tailoring communication for different social groups (students, professionals, administrators, citizens, members of local associations) is useful to calibrate the communication project or the intervention with respect to the needs, expectations and capacities of each group. Targeting communication to specific groups can allow resources and strategies to be focused more effectively and efficiently, avoiding unproductive dispersion and over-exposure to generic information (which may have the opposite effect to that desired, such as saturation or disinterest). For example, one group may particularly benefit from better information on the location of risk areas (e.g. digital maps on smartphones), while another may be more interested in more information on mitigating impacts on their activities (e.g. things to do before, during and after an event), at different levels (e.g. individual, neighbourhood, municipality level).
Risk communication in the context of emergencies (alert) should take into account the daily dynamics in the number of inhabitants actually at home: the number of people present at home can vary considerably between working days and holidays (a difference of more than 100% in the morning and about 50% in the afternoon has been noted), and these differences can vary among municipalities. The fact that on working days, more than half of population commutes or leaves their municipality on a regular basis indicates that it might also be relevant to set up communication channels. For example, instant messages on mobile phones could be directed to

people at home and in offices, alerts on commercial radios could better reach commuters driving their cars or bus drivers. These information channels could help calibrate and differentiate risk communications depending on the time of day, working day or holiday, and specific community.

Perceptions of risk may differ from reality; for example in subjective probability estimates, one fifth of respondents consider the possibility of wildfires or earthquakes to range from unlikely to theoretically impossible, despite the fact that their territories are medium-high risk areas for earthquakes and high risk areas for wildfires. This points to a gap that needs to be filled and monitored and suggests developing specific information campaigns based on updated risk maps and tools to verify any gaps between perception and reality and their possible changes over time.

With regard to self-preparation in the event of a disaster, it is interesting that almost 20% of respondents would not know what to do in the event of an earthquake, while only 26% keep themselves informed. This highlights the importance of information and training on the effective practices in an emergency. The latter can only be achieved through frequent repetition, bearing in mind that in the event of a disaster, especially if associated with strong emotions, the activation of suitable reactions is only possible if the correct reactions are learnt to the point of being 'automatic'.

In this regard, the positive impact of volunteer rescue work in the community may be very relevant (20% of the respondents were interested); among people with rescue experience the sense of self-efficacy and the demand for training increases. This suggests that one leverage point for increasing effectiveness in risk communication is to continuously invest in local associations and facilitate their active participation in defining communication programmes and projects, valuing their contribution and creating opportunities and a 'sense of usefulness' (a key motivation in associations). With regard to voluntary work, the greater participation of women was noted; this merits further research and systematic support for local volunteering associations.

Again with regard to self-preparedness, it is relevant to note that 40% would have considerable difficulties in finding temporary accommodation in the event of an emergency. This difficulty can be associated with age (significant differences were shown in related responses). A high percentage of elderly people combined with a high percentage of lonely people substantially decreases the resilience of a community: as the average age and loneliness increase in a community, individual resources, including both physical and cognitive abilities, and social resources inevitably decrease. These weaknesses can be compensated by nurturing neighbourhood relations and by tailoring services or resources co-created by the same community. This suggests that the design of risk communication and management should also include the definition and maintenance of spaces and relationships to cultivate reciprocity at the community level. Focus groups, for example, in the form of anticipatory dialogues, developed in the field of social services (Arnkil, 2019), could be effective in this regard.

Regarding to people's trust in institutions, only 36% would be willing to leave their homes immediately in the event of a mayor's order to evacuate the area. This is equivalent to imagining that in the event of a fire, less than 4 out of 10 fire extinguishers would work immediately, and highlights the importance of the social dimension in risk management, in particular the relationship between citizens and the municipal administration. Obviously, there are many aspects concerning this relationship that are not addressed within the question on the readiness to evacuate; at the very least, the questionnaire's data suggests that this issue should be explored in greater depth in subsequent surveys. For this purpose, focus groups made up of different social groups, including administrators, could offer useful elements.

Due to the rapidity of technological, social and environmental changes "risk assessments are always limited by the questions one can think of to ask" (Martineau 2003, p. 92). The questionnaire made it possible not only to find some answers to predefined research questions but also to ask new ones. Assuming that a "good question is a half-answer", we report some of these questions with the aim of focusing new directions for action-research:

- ageing theme: how can risk management and risk communication methods be adapted to

be effective in increasingly ageing communities? In particular, what changes in needs, values, behaviour and agency should be considered?

- community identity and technological innovations: how can a synergy between the human aspects (human capital, social capital) of community resilience and technological or structural innovations (e.g. new mobility, new media, new infrastructures) be sustained over time, avoiding creating "accidental adversaries" by adopting technologies e.g. with unequal accessibility?
- multiple generations: how can participation workshops promote social cohesion between generations with a view to collaborative and anticipatory civil protection?
- knowledge and perception: what are the most relevant gaps between perceived and current (known) risks in each community and how can they be bridged?

Answers to these largely unexplored questions could provide useful references to further improve and define inclusive and anticipatory risk management strategies, supporting community resilience over time.

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Table 1. Questionnaire questions and possible answers.

Q1. Which category do you most belong to or recognise yourself in?	Q1.1 Administrator or public official Q1.2 Professional with local business activities Q1.3 Member of local association or group Q1.4 Student or teacher Q1.5 Citizen
Q2. On a normal working day: how many people are present in the flat at the following time slot? (Options: from 0 to 7 or more)	Q2.1 00:00 - 6:00 Q2.2 6:00 - 8:00 Q2.3 8:00 - 12:00 Q2.4 12:00 - 16:00 Q2.5 16:00 - 20:00 Q2.6 20:00 - 24:00
Q3. On a holiday day: how many people are present in the flat at the following times? (as above)	As above Q3.1-2-3-4-5-6
Q4a. During the day, where do you spend most of your day? (2 options)	Q4a.1 At home, or in the village Q4a.1 Outside the municipality of residence (e.g. commuting for study or work)
Q4b. In case you are commuting, how long are you generally travelling (adding round trip)?	Q4b.1<30 minutes Q4b.2 30 to 60 minutes Q4b.3 60 to 90 minutes Q4b.4 90 to 120 minutes Q4b.5 over 120 minutes
Q4c In the case of commuting, it moves with: (2 options)	Q4c.1 private vehicle Q4c.1 public transport
Q5. Apart from work, the most frequent trips outside their municipality of residence are for:	Q5.1 purchasing Q5.2 public services (bank, post office, ...) Q5.3 medical services (hospital, doctor, ...) Q5.4. recreation (sport, cultural event, ...)
Q5b. On average, how long are you travelling (adding round trip)?	Q5b.1 <30 minutes Q5b.2 30 to 60 minutes Q5b.3 60 to 90 minutes Q5b.4 90 to 120 minutes Q5b.5 over 120 minutes

Q6. How much do you agree with the following statements? (One answer for each statement) (5 options: from "Totally agree" to "Not at all agree", plus "I don't know")	Q6.1 Earthquakes and hydrogeological instability (e.g. landslides, debris flows) are a real risk for my territory Q6.2 Earthquakes and hydrogeological instability can put my business at risk Q6.3 Natural damaging events will become more frequent Q6.4 Risks are minimised by structural interventions (e.g. embankments, protections, reinforcements) Q6.5 The population generally has few tools and little awareness to deal with risks Q6.6 In general, earthquakes and hydrogeological instability do not pose a relevant threat to me or my business
Q7. In your opinion, what is the probability of the following events in your municipality in the next 10 years: (6 options: from "Theoretically Impossible" to "Theoretically Certain")	Q7.1 Earthquakes Q7.2 Landslides Q7.3 Forest fires Q7.4 Floods Q7.5 Road interruptions
Q8. What impact do you think they could have on the community in terms of willingness to stay and maintain residence and activities or leave: (5 options: Low importance | Some importance | quite relevant | extremely relevant | I don't know)	Q8.1 Earthquakes Q8.2 Landslides Q8.3 Forest fires Q8.4 Floods Q8.5 Road interruptions
Q9. In your opinion, considering the most recent calamitous events in your municipality, what were the main consequences in the immediate release? (5 options: Very much in agreement | Somewhat agree | Little agreement | Not at all agree | I don't know)	Q9.1 Damage to persons Q9.2 Damage to property (e.g. houses, buildings, warehouses) Q9.3 Damage to economic activities Q9.4 Temporary interruption of drinking water, electricity or other services Q9.5 Temporary traffic interruption
Q10. In your opinion, considering the most recent calamitous events in your municipality, what could be their consequences in the long term? (5 options: Very much in agreement | Somewhat agree | Little agreement | Not at all agree | I don't know)	Q10.1 Displacement of economic activities Q10.2 Interruption or displacement of public services Q10.3 Business closure (company bankruptcy) Q10.4 Psychological fears and traumas Q10.5 Contribution to emigration
Q11. In your opinion, what actions could improve community response and preparation to calamitous events (e.g. earthquakes, landslides)? (5 options: Very much in agreement | Somewhat agree | Little agreement | Not at all agree | I don't know)	Q11.1 Mapping natural hazards on the territory Q11.2 New protection or consolidation works Q11.3 Create or renew emergency plans Q11.4 Training for administrators and technicians Q11.5 Training for local companies and professionals Q11.6 Training for citizens, associations, schools
Q12. Would you know what to do personally during an earthquake?	Q12.1 I don't know exactly Q12.2 I think I know what to do, I informed myself Q12.3 Yes, I also keep myself informed through Civil Protection campaigns
Q13. Of the things you should do at home before an earthquake, what would you and your family or housemates improve on most? (only one answer)	Q13.1 Place heavy objects in low shelves and use furniture doors with a catch so that objects do not fall out during the shock Q13.2 Learning where and how to close gas, water and general electric taps Q13.3 Keep a first-aid kit, torch, battery-powered radio in the house, making sure everyone knows where they are Q13.4 Identify safe places in the home where to take shelter during the shock Q13.5 Find out if the municipality's emergency plan exists and what it provides for Q13.6 None of these
Q14. Do you have any rescue or simulation experience?	Q14.1 I am (or have been) a volunteer in Civil Defence, Red Cross or similar organisations Q14.2 I participated in simulations of catastrophic events (excluding simple evacuation tests) Q14.3 I have experienced calamitous events in which rescue personnel and means were involved Q14.4 None of these
Q15. If you had to evacuate tonight due to danger, how easily would you find temporary accommodation (e.g. with relatives, neighbours, etc.)?	*No difficulty* 1 | 2 | 3 | 4 *Considerable difficulty*
Q16. If a warning came from the mayor to evacuate the area and leave your home, would you do so immediately?	*Certainly, the mayor has the responsibility and adequate information* 1 | 2 | 3 | 4 A*fter making my own evaluations with my knowledge*

Francesca Uleri, Benedetto Meloni, Alessadra Piccoli, Susanne Elsen[1]

Aree interne tra deagrarizzazione e riagrarizzazione: giovani agricoltori e meccanismi di ritorno all' "osso" in Centro Sardegna[2]

Introduzione[3]

Nella seconda metà del secolo scorso si è innescato nel nostro Paese un processo di radicale trasformazione della geografia economica e di insediamento che è gradualmente andata a determinare una forte riduzione della popolazione attiva in agricoltura e una significativa restrizione delle aree coltivate. Ciò è avvenuto con particolare rilevanza soprattutto nelle aree collinari e montane dove le terre prima dedicate ai pascoli e seminativi sono state in parte coperte da incolti e cespugliati, occupate dalla vegetazione pioniera del bosco, o indirizzate verso nuovi usi (es: residenziale, *amenity migration*). In pianura si è assistito invece all'abbandono di sistemi agrari tradizionali – onerosi per l'intensità di lavoro – a favore di più spinti livelli di meccanizzazione che hanno ridotto, tra i vari elementi, la capacità di invaso, la riserva di biodiversità, l'articolazione paesaggistica, ecc. (Baldini, Lupatelli, 2014). Le Aree Interne del Paese largamente investite da abbandono e indebolimento dei presidi agricolo-aziendali sul loro territorio sono state colpite, seppur non omogeneamente, da processi di erosione del capitale territoriale.

Tuttavia, sebbene tali processi siano tuttora in atto – con modalità e misure differenti tra territori e non di rado anche tra paesi limitrofi - e parallelamente sull'intero livello nazionale si continui ad assistere a un incremento dell'invecchiamento dei conduttori di azienda agricola (Istat, 2022)[4], da diversi studi (Corrado, 2010; Cersosimo, 2012; Milone & Ventura, 2019; Jansuwan & Zander, 2022) è comunque possibile rilevare processi micro, di ritorno dei giovani in agricoltura come scelta individuale ragionata e non come orientamento di ripiego su "ciò che resta" rispetto alle possibilità di realizzazione in altri settori. In tale prospettiva, l'agricoltura diviene ambito in cui radicare e innestare progettualità di vita personali e professionali che si discostano dalle diversificate derive della crisi urbana e dei modelli di vita metropolitani (Greco, 2014), nonché da altri ambiti lavorativi nel terziario e nell'industria dimostratesi vacillanti, precari (Nogué, 2012) e meno attrattivi, soprattutto nel periodo Covid e immediato post-Covid (Albani *et al.*, 2021).

Queste scelte si concretizzano attraverso la strutturazione di idee imprenditoriali innovative che si affiancano a rimodellamenti di assetti aziendali-familiari preesistenti; altre volte danno origine del tutto nuova a realtà economiche che si inseriscono attivamente nel tessuto socio-economico locale contribuendo in maniera ampia a una continua definizione dei rapporti tra campagna e città. Dal Rapporto 2022 *Giovani e Agricoltura* (ISMEA-RRN, 2022) emerge infatti che nelle aziende agricole con giovani conduttori vi è una maggiore propensione all'innovazione e all'informatizzazione rispetto a quelle non giovani (over 40). Innovano 2,5 imprenditori giovani su dieci contro uno solo su dieci over 40, mentre la quota di imprese giovani informatizzate è più che doppia rispetto a quelle condotte da over 40[5].

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3 Questo articolo è frutto di una riflessione congiunta degli autori sulla base di dati derivanti da un percorso di ricerca "eco-social transformation in rural areas" condotto da Francesca Uleri nel quadro di un assegno di ricerca finanziato da UNIBZ nel periodo 2020-2022. Su questa base i contributi individuali al testo possono essere così suddivisi: Francesca Uleri ha scritto l'introduzione e i paragrafi 1 - 1.1 - 1.2 - 2 - 2.1; Benedetto Meloni ha sviluppato le riflessioni conclusive e le indicazioni di policy (paragrafo 3); Alessandra Piccoli ha contribuito con integrazioni al paragrafo 3; Susanne Elsen è stata responsabile scientifica della ricerca e ha contribuito con integrazioni alla sezione introduttiva.

4 Dal 2010 al 2020 l'incidenza (sul totale) della presenza di aziende agricole con capo azienda fino a 40 anni passa da 11,5% a 9,3% (valore assoluto: da 186.491 a 104.886).

5 Entrando nel dettaglio la quota di aziende condotte da giovani è quattro volte superiore rispetto alla quota di over

Negli anni '60, Rossi-Doria (1982) strutturava per il contesto agricolo italiano un sistema zonale che identificava "molteplici agricolture" distribuite su aree differenti, dalle grandi aree irrigue con alta intensivizzazione dei processi di produzione agricola, alle Aree Interne contraddistinte dalla presenza unica di un' agricoltura estensiva e marginale. Come evidenzia Mantino (2023), oggi però, in virtù delle innovazioni tecnologiche, del mutamento delle tecniche produttive e delle strategie di commercializzazione e marketing, e delle ampie trasformazioni sociali ed economiche delle campagne a cui le giovani generazioni di agricoltori contribuiscono, risulta anacronistico e irrealistico parlare in maniera omogenea di un solo tipo di agricoltura per le Aree Interne, piuttosto si vedono agricolture e filiere agro-alimentari altamente differenziate[6].
Dato ciò, si è davanti a una presenza – o meglio compresenza – di movimenti di deagrarizzazione e riagrarizzazione all'interno di specifici territori delle Aree Interne. Questo presuppone quindi di adottare, in maniera sistemica, chiavi di lettura connesse che tengano conto sia dei processi di generazione dei cosiddetti "vuoti" «del declino demografico, dello spopolamento e dell'abbandono edilizio, della scomparsa o del degrado di servizi pubblici vitali» (Cersosimo & Donzelli, 2020, p. 3), sia dei processi che hanno portato alla resistenza e alla generazione dei "pieni", alla centralità delle specificità e delle risorse territoriali, determinati nella nuova imprenditorialità agricola e nel passaggio dai vecchi sistemi contadini a quelli odierni multifunzionali, capaci di generare alti livelli di valore aggiunto (van der Ploeg *et al*., 2019).
Alla luce di quanto fin qui definito, questo contributo ha l'obiettivo di inquadrare le Aree Interne come luoghi specifici in cui si possono riscontrare in maniera non mutualmente esclusiva meccanismi di deagrarizzazione e riagrarizzazione differenziata che – data la centralità dell'azione dell'azienda agricola all'interno dei sistemi rurali locali – ne determinano congiuntamente il differente profilo ambientale, demografico, insediativo economico e sociale. Particolare enfasi è data al ruolo dei giovani nell'attivare un nuovo processo di agrarizzazione che va discostandosi dalle dinamiche di agrarizzazione intensiva. A tal riguardo, l'articolo, attraverso uno studio di caso con focus sullo scenario agrario dei territori della Barbagia-Mandrolisai e Ogliastra (Sardegna centro-orientale) mette in luce i meccanismi di attivazione di una nuova traiettoria di agrarizzazione caratterizzata dalla transizione alla multifunzionalità e dalla necessità di riprodurre primariamente il capitale territoriale quale base per continuare a operare – come unità produttiva (Chayanov, 1966) – nel lungo periodo.
Lo studio si basa su un'indagine esplorativa quali-quantitativa che ha interessato 8 aziende agricole localizzate nei territori sopradetti, la cui gestione è in mano a giovani subentrati nella struttura aziendale familiare o entrati per la prima volta in agricoltura (*newcomers*) da under 40 nel periodo 2006-2021. Al fine di identificare casi aziendali potenzialmente rilevanti per lo studio di caso, questi sono stati selezionati all'interno del gruppo regionale Coldiretti Giovani Impresa e nello specifico tra le relative realtà aziendali si sono contraddistinte per avere promosso innovazioni di prodotto (es: recupero varietà colturali antiche) e di processo (es: coinvolgimento consumatore nelle pratiche produttive), attraverso un'attivazione di risorse disponibili, aziendali o territoriali. I soggetti intervistati sono conduttori-titolari di aziende, principalmente di tipo individuale a conduzione familiare. Considerato il limitato numero di casi selezionati, la rilevazione si è concentrata – come carotaggio di buone pratiche – su casi esemplari territoriali (ad esempio premiati con Oscar Green Coldiretti), al fine di verificare le dinamiche di ingresso in agricoltura e l'innesto in traiettorie di riattivazione/rigenerazione territoriale.

40 per le innovazioni promosse nelle sfere di vendita e marketing, organizzazione e gestione aziendale, struttura e utilizzo degli edifici rurali aziendali (ISMEA-RRN, 2022).

6 Nel Rapporto 2022 *Sviluppo rurale e Strategia Nazionale per le Aree Interne* (si veda Mantino, 2023, p.3), si identificano tre tipi di filiere: «(1) filiere di qualità (con Indicazione geografica) e forme di aggregazione orizzontale/verticale […]; (2) piccole filiere scarsamente organizzate e mix di micro-produzioni locali di elevata qualità; (3) filiere forestali con orientamenti plurimi: conservazione ambientale […] e produzione di legname […] e di biomassa».

È dunque una selezione specifica di modelli reali di imprenditorialità tra tradizione e innovazione a buon livello di sostenibilità in ambiti territoriali definiti che riflettono una tendenza di comportamenti presenti negli scenari agrari locali. Alla luce di ciò, in assenza di rilevazioni estese, tali casi non possono però essere considerati come marginali e tantomeno irrilevanti, anche perché inseriti in contesti relazionali per tipologie di produzione peculiari (olearia, castanicola, casearia, apistica, ecc.), danno conto di significativi processi evolutivi in atto (Meloni, 2020).
L'indagine empirica è stata svolta nel 2021 attraverso la conduzione di interviste semi-strutturate orientate a: (i) ricostruire gli aspetti motivazionali che hanno guidato il subentro in azienda o il primo arrivo in agricoltura, e (ii) individuare gli elementi che proiettano l'azienda oltre il suo perimetro e ambito di profitto per posizionarla all'interno di un sistema articolato in cui l'agrarizzazione nuova è perno di un processo ampio di rigenerazione territoriale.
Su questa base l'articolo cerca di restituire un'immagine delle Aree Interne quali territori che si dimostrano essere un sistema in cui «le potenzialità di sviluppo sono nascoste nelle pieghe più inattese delle società locali» (Becattini, 2015, p. 94), e in cui si assiste gradualmente all'apparire di iniziative di sviluppo che si adattano alle culture e alle condizioni, alle esigenze e alle vocazioni produttive locali.

1. Riagrarizzazione e deagrarizzazione come movimenti strutturanti del rurale[7]

Nel tracciare il quadro di comprensione dei processi di rimodellamento e ristrutturazione delle campagne – nonché dei processi sociali di ridefinizione degli scenari agrari locali quali base caratterizzante della dimensione rurale delle Aree Interne – questo non può esulare dall'adozione di una più ampia lente concernente l'analisi dell'evoluzione del capitalismo contemporaneo.
Diventa infatti imprescindibile l'ancoraggio analitico a una lente sistemica capace di dare conto delle connessioni tra meccanismi di produzione e riproduzione del capitale, di accumulazione, e degli effetti diretti e indiretti sul profilo del rurale e primariamente della struttura sociale che nello spazio rurale si interseca. È importante chiarire dunque sin da principio che gli scenari agrari (occupazione, produzione e struttura sociale dell'agricoltura) sono elementi caratterizzanti, forgianti del rurale, tuttavia analiticamente non vanno intrappolati nel «*vestito troppo stretto dell'ambito rurale*» (Mingione, 1984, p.8) ma vanno visti in connessione a una più ampia organizzazione sociale e a processi che si innescano e/o si diramano su dinamiche e fattori esogeni.
Alla luce di ciò, la penetrazione capitalistica delle campagne, ovvero l'avanzare attraverso cui il capitalismo ingloba, "sussume" complessi produttivi locali in una logica di sistema, procede sulla scia di due movimenti possibili, di cui uno di tipo diretto, la (ri)agrarizzazione, l'altro di tipo indiretto, la deagrarizzazione.
Il primo implica l'introduzione di nuove tecniche, pratiche e tecnologie produttive in una prospettiva di sussunzione reale del lavoro agricolo al fine di incentivare la crescita dell'economia di scala, la specializzazione, e l'integrazione a monte e a valle con il sistema dalla trasformazione e dalla grande distribuzione agroindustriale (si veda ad esempio McMichael, 1997); l'elemento fondamentale che ne contraddistingue l'individuazione è il nuovo – o rafforzato – flusso di risorse umane e economico-finanziarie indirizzate all'agricoltura, verticalmente controllate e non omogeneamente accessibili e distribuite (Uleri, 2020). Nella letteratura dei *critical agrarian-studies,* ne è un esempio classico il passaggio dall'agricoltura contadino-familiare all'agricoltura di piantagione nei contesti del Sud globale (Paulino, 2014). Al contrario, la deagrarizzazione, definita da Bryceson (1993, p.5) come un processo di «riorientamento dell'attività economica e dei mezzi di sussistenza (*livelihoods*) e riaggiustamento occupazionale», si compone di un flusso di risorse

7 Questo paragrafo riprende – in chiave rielaborata – alcune parti della sezione "Dalla campagna agricola alla campagna rurale tra processi di agrarizzazione e deagrarizzazione: nuove prospettive di ruralità" interna al report introduttivo alla Edizione 2022 della Scuola di Sviluppo Locale "Sebastiano Brusco, intitolato "Prospettive di sviluppo per le Aree Interne: multifunzionalità e progettazione del turismo rurale" e presentato a Seneghe come materiale didattico nel luglio 2022 da Benedetto Meloni e Francesca Uleri.

umane e/o economico-finanziarie in uscita, diretto dall'agricoltura verso attività non agricole soprattutto in aree non rurali. Ne è esempio l'abbandono dei terreni agricoli di montagna e il relativo spopolamento delle borgate alpine davanti alla crescita dei poli industriali di pianura o la conversione dei suoli agricoli periurbani per usi differenti a supporto dell'espansione della frontiera urbana.
Considerando il caso italiano, è proprio nelle pianure fertili come, ad esempio, l'Agro pontino, l'Agro Romano, la Piana del Sele, il Metapontino, la piana di Catania, o la Pianura Padana e la Capitanata – oggi aree particolarmente vocate per l'agricoltura ad alto reddito (es: orticoltura, frutticoltura e floricoltura) – che si realizza, dal dopoguerra in poi, un processo di agrarizzazione nuova (*riagrarizzazione*) sulla scia del paradigma di una modernizzazione produttivistico-industriale. Divenendo la crescita settoriale il principale obiettivo delle politiche di sviluppo economico in agricoltura, la prospettiva attesa prevedeva un'integrazione del settore nella *supply chain* attraverso processi di intensificazione e razionalizzazione produttiva con la conseguente scomparsa delle piccole aziende contadine, considerate inefficienti e non specializzate.
A metà del secolo scorso Rossi-Doria, in riferimento alle "campagne difficili" del Meridione – terre generalmente poco popolate, con struttura demografica dispersa in piccoli centri, dominate da appezzamenti poco fertili e acclivi, scarsamente dotate di vie di comunicazione e di collegamenti con le città, le pianure, il mare (Bevilacqua, 2002) – inquadrò la loro situazione attraverso la metafora dell' "osso" distinto dalla "polpa" delle aree agro-industriali, industriali e urbane più prospere. L'osso appariva infatti come la più appartata «geografia della povertà in un mondo in cui lo sviluppo capitalistico e i processi di modernizzazione venivano trasformando il territorio meridionale con un'ampiezza, profondità e rapidità mai prima sperimentate» (*ivi*, p. 7). Da ciò si evince dunque come al carattere escludente non sia corrisposta un' assenza di rimodellamento delle campagne in cui la modernizzazione non prese piede (c.d. modernizzazione difficile), in quanto questa si riflesse indirettamente, dalla polpa all'osso, attraverso un movimento di deagrarizzazione che comportò non solo un parziale spegnimento dell' agricoltura così come lo definisce il sociologo olandese van der Ploeg (2008) in termini di *disattivazione*, bensì un vero e proprio rimodellamento del substrato agrario (stratificazione sociale delle campagne), del profilo demografico, del paesaggio, dei modelli di insediamento, del patrimonio infrastrutturale e abitativo, e delle pratiche colturali.
La modernizzazione difficile non è stata elemento propriamente esclusivo della storia agraria Meridionale bensì elemento proprio dell'evoluzione economico-sociale di una molteplicità di territori senza distinzione di latitudine, infatti questa si è presentata con caratteristiche e impatti nella natura simili in altri contesti nazionali sia del Nord e che del Sud Globale (Storper, 1991). Non è fatto nuovo, né fatto endemico del contesto italiano ma natura stessa del capitalismo caratterizzata da un procedere temporalmente e spazialmente disomogeneo che dà vita a una molteplicità di frizioni, asincronie, e rapporti di subalternità non solo tra gruppi sociali ma anche tra territori (Gough, 1991; 1996; Cox 1997; 1998). In quest'ultimo caso specifico si crea una condizione di funzionalità attraverso cui le campagne "difficili" perdono risorse – in particolar modo lavoro e capitale sociale – dirette ai territori-centro ("*core regions*"). È proprio questa emorragia, affiancata e aggravata da politiche di sviluppo centralizzanti, che ne ha determinato nel lungo periodo una conseguente marginalizzazione-periferizzazione (Cersosimo *et al*., 2018).

1.1. Deagrarizzazione e Aree Interne: dalla questione agraria "del capitale" alla questione dei territori

Nei territori caratterizzati da processi di deagrarizzazione e primaria modernizzazione difficile, lo spopolamento e abbandono delle terre rappresentano generalmente elementi caratterizzati seppur non omogenei, riflesso dell'erosione della base contadina familiare che negli anni è stata interessata da un flusso in uscita di manodopera diretto prevalentemente verso aree urbane e periurbane. Nel nostro caso nazionale si è di fronte a un insieme multidimensionale di aree

alle volte considerabili "fragili" (Osti & Ventura, 2012), di piccole Italie (Borghi, 2017) che – con sguardo specifico al complesso Aree Interne – rappresenta il 52% dei comuni italiani, il 22% della popolazione e circa il 60% della superficie territoriale del Paese (Lucatelli *et al*., 2019), quindi, come sottolineato da Barca (2013):

> «*circa tre quinti del territorio e poco meno di un quarto della popolazione, assai diversificata al proprio interno, distante da grandi centri di agglomerazione e di servizio e con traiettorie di sviluppo instabili ma tuttavia dotata di risorse che mancano alle aree centrali, rugosa, con problemi demografici ma anche fortemente policentrica e con forte potenziale di attrazione* [...]. *E richiede attenzione al fatto che da queste aree vengono beni necessari per tutti noi: acqua, aria buona, cibo, paesaggi, cultura*».

Il processo di deagrarizzazione si distingue in maniera netta se ci si focalizza sui dati relativi alla variazione nella Superficie Aziendale Totale (SAT)[8] cioè alla variazione nell'insieme dei coltivi, dei boschi e degli incolti riconducibili a responsabilità e operato di un'unità economica quale l'azienda agricola: la SAT può essere quindi definita quale indice valido per monitorare il "governo" e presidio agricolo dei territori.
Nel 1961, il primo Censimento Generale dell'Agricoltura, dava conto di una superficie aziendale totale di 26,5 milioni di ettari, pertanto si può affermare che il governo agricolo del territorio copriva pressoché integralmente lo spazio geografico italiano; in netta linea di rottura con queste cifre, il più recente Censimento Agricolo del 2010 segnala invece che la SAT delle aziende agricole in esercizio si è ridotta a 17 milioni di ettari, con una riduzione che sfiora i 100mila km^2, circa un terzo della estensione totale del Paese (Baldini e Lupatelli, 2014). Nello specifico, nelle Aree Interne nazionali la diminuzione è stata del 36%, leggermente più accentuata rispetto ai "centri" dove invece si è registrata una riduzione del 34,5% (ibid.). Nel caso della Sardegna, la riduzione sull'interno territorio regionale è stata di circa il 34%, con un' erosione del presidio agricolo aziendale che è andata avanzando dai 2.224.258 ettari del 1961 a 1.471.715 ettari del 2010, mentre, nello stesso arco di tempo, la variazione SAT nelle Aree Interne dell'isola passava da 1.894.899 a 1.273.172 ettari, pari al -32,8% della precedente estensione (CAIRE, 2014).
La riduzione della presenza della piccola ma diffusa agricoltura contadina nei territori delle Aree Interne è, come detto, effetto di un processo di deagrarizzazione che concretamente si sviluppa nei territori rurali attraverso un meccanismo di differenziazione del reddito non solo oltre l'azienda ma anche oltre il territorio del suo operato, risultando in un declino di lungo periodo delle attività *agrarian-based* (si veda Vanhaute, 2012) e delle pratiche legate a autoconsumo e autosufficienza di input produttivi. Questo processo ha rappresentato il cuore e l'elemento costante dell'analisi della questione agraria in Italia animata (su posizioni differenti) negli anni Cinquanta da voci come quelle di Serpieri, Sereni e Rossi-Doria, ripresa e approfondita poi negli anni Settanta tra posizioni contadiniste e decontadiniste (si veda ad esempio Barberis, 1970; Daneo, 1971). Il focus sulla deagrarizzazione è stato centrale per intercettare il meccanismo dominante di quella che Bernstein (2006) – rifacendosi ai classici (Marx, 1976; Kautsky, 1988) – definisce essere la questione agraria "classica", ovvero la questione agraria del capitale, nonché di come parte della popolazione rurale con controllo sui propri mezzi di produzione (terra e lavoro) sia diventata gradualmente parte di forza lavoro contrattualizzata sia nella sfera produttiva delle aree rurali che in quella delle aree urbane e peri-urbane in seguito a migrazione.
Nel caso delle campagne delle Aree Interne italiane questa trasformazione sociale dei tessuti agrari locali si è innescata soprattutto attraverso lo spostamento rurale-urbano in quanto è prevalentemente mancato un flusso di investimenti nelle campagne – non necessariamente orientato al settore agricolo – che potesse definire nuovi indirizzi economici di queste aree e nuove basi di servizi. Pertanto l'accentramento dei flussi di risorse pubbliche e private in territori-centro è risultato in un assottigliamento del presidio agricolo dei territori determinato da una

8 Area complessiva dei terreni dell'azienda destinata a colture erbacee e/o legnose agrarie inclusi i boschi la superficie agraria non utilizzata nonché l'area occupata da parchi e giardini ornamentali, fabbricati, stagni, canali, ecc., situati entro il perimetro dei terreni che costituiscono l'azienda.

dispersione e distribuzione altrove di forza lavoro e capitale sociale. Il movimento strategico di centralizzazione dei servizi specialmente nei complessi metropolitani è stato generalizzato. Con l'aumentare delle dimensioni e della scala delle strutture di servizio, di produzione, di consumo in connessione ai processi di globalizzazione tecnofinanziaria, il processo di indebolimento dei territori periferici e marginali ha riguardato di conseguenza non solo la dimensione agricola che è andata in parte a perdere "braccia e menti" con controllo sulla terra e sui processi produttivi ad essa connessi, ma anche, ad esempio, i servizi sanitari locali, le banche del territorio, i piccoli uffici postali, i piccoli tribunali, le piccole stazioni e linee ferroviarie minori, le piccole imprese, le piccole scuole di montagna, e così via (Carrosio, 2019; Bolognesi & Magnaghi, 2020).
La questione agraria così tanto discussa negli anni del boom economico ci si presenta oggi con uno dei suoi più intrinsechi e inscindibili lasciti, la questione dei territori "periferia". Questa indissolubilità del discorso sulla questione agraria e l'attuale dibattito sulle Aree Interne è data dal fatto che l'agricoltura ha – in questi territori – una forte funzione regolatrice dei sistemi rurali locali, determinando – seppur non in maniera esclusiva – la natura e i contenuti dei rapporti sociali, le opportunità di connessione extra-territoriale, i caratteri culturali, le pratiche di consumo, gli stili architettonici, ecc. In riferimento a questi contesti però non si parla di agricoltura in maniera indistinta ma di agricoltura contadina, spesso su base familiare. Non è necessariamente orientata al mercato, è contraddistinta da un processo di *downgrading* (si veda Milone, 2004) finalizzato a una produzione-riproduzione interna di input produttivi, e di conseguenza di utilizzo e riproduzione del capitale territoriale (es: risorse naturali, know-how locali, relazioni di fiducia, ecc.), quale insieme di risorse disponibili da rigenerare con l'obiettivo di ottimizzazione il processo produttivo e minimizzare i costi.
In questa prospettiva, la deagrarizzazione ha avuto un raggio di impatto che è andato oltre la dimensione agricola familiare/aziendale traducendosi in un' erosione della vita comunitaria di questi luoghi, in un rarefarsi dei legami di fiducia (Bilewicz & Bukraba-Rylska, 2021) e in depauperamento del capitale umano, del patrimonio insediativo e del capitale naturale (Calvaresi, 2015; Storti & Prosperini, 2020). Lo Presti (2017) marca inoltre che a fronte di un fenomeno di abbandono dell'agricoltura, si rilevano sempre più ripercussioni sulla qualità del sistema relazionale e - più in generale - sullo stile di vita di chi sceglie di restare a vivere in queste aree.
In coerenza con questo quadro, come evidenziato dal CAIRE (2014), nel panorama delle Aree Interne, il territorio che è stato lasciato vuoto dall'attività agricola non è stato, in larghissima misura nell'ultimo cinquantennio, "preso in consegna" da qualsiasi altro soggetto che si facesse carico in maniera così incisiva di assicurare un' azione di presidio, manutenzione e rigenerazione del capitale territoriale per accompagnare la transizione verso diversi usi e funzioni a bassa intensità di prelievo. I costi sociali della polarizzazione delle dinamiche di sviluppo attorno alle grandi città e città medie divengono quindi palesi e manifesti nel dissesto idrogeologico, nella perdita di biodiversità, sino alla carenza di servizi di base per le comunità insediate (istruzione, sanità, mobilità, connettività virtuale) o nello stesso potere d'acquisto delle famiglie (Colavitti *et al*., 2018)[9].

1.2. Oltre la deagrarizzazione: dai vuoti allo sguardo sul "pieno"

In linea generale all'interno degli *agrarian studies* la deagrarizzazione viene solitamente rilevata tramite indicatori come la riduzione degli addetti al settore agricolo, o la riduzione nei valori SAU e SAT, andando quindi poi ad essere descritta come processo di diminuzione della rilevanza del ruolo dell'agricoltura nell'economia locale e/o nazionale (Bilewicz & Bukraba-Rylska, 2021). Tuttavia per quanto riguarda le Aree Interne italiane, questa si riscontra indubbiamente attraverso gli indicatori sopracitati, ciononostante si va a definire uno scenario in cui l'agricoltura "perde

9 Ad esempio, nelle Aree Interne, il reddito imponibile (ai fini Irpef) medio per abitante nel 2010 era pari del 18% in meno di quello dei centri, oltretutto, su dati 2004-2010 si nota che il reddito medio imponibile per abitante delle Aree Interne è cresciuto meno (+10,6%) rispetto a quello dei centri (+11,4%), segnando un ulteriore incremento del differenziale tra queste due aree (Carlucci, Lucatelli, 2013).

notevolmente piede" non perdendo però importanza e centralità (Bevilacqua, 2014). Infatti, per ciò che concerne la specializzazione produttiva, seguendo uno studio Ifel (2015) che determina l'incidenza delle imprese attive in un determinato settore economico in ogni comune in rapporto al totale delle imprese attive nello stesso, tenendo conto che un comune può essere definito "specializzato" se tale rapporto risulta maggiore dello stesso rapporto calcolato a livello nazionale, è possibile dire che nelle realtà comunali italiane spicca una vocazione imprenditoriale agricola, con il 58,9% delle amministrazioni comunali in cui questa specializzazione è prevalente (Marongiu & Cesaro, 2016). È nelle municipalità delle Aree Interne che la specializzazione nel settore primario si estende raggiungendo il 72,9% di esse, mentre i comuni dei centri si fermano a una soglia del 43,4%. In una condizione spesso di polverizzazione aziendale-fondiaria e di difficile morfologia del territorio (Cimino, 2021), il 52,2% delle aziende agricole delle Aree Interne opera con un'agricoltura resistente – sovente definita eroica – in comuni di montagna e il 30,8% in collina mentre circa la metà delle aziende dei centri (49,6%) si colloca invece in pianura e il 38,9% in collina.

L'agricoltura quindi, nonostante la perdita estesa di presidio sul territorio, svolge ancora un importante ruolo non solo in termini di occupazione e di reddito prodotto per le Aree Interne ma anche e soprattutto in termini di prospettive per le nuove generazioni. Dallo studio *Giovani Dentro* (Barbera *et al*., 2021) – progetto di ricerca che ha indagato la realtà e le prospettive della popolazione delle Aree Interne compresa tra i 18 e i 39 anni in termini di motivazioni a restare o andar via, bisogni e opportunità socio-economiche cercate e attese – risalta che per quanto riguarda le prospettive future, il settore agricoltura, silvicoltura e pesca è il principale settore in cui i giovani vorrebbero svolgere la propria attività una volta conclusi gli studi (19,8%), seguito da settore dell'istruzione (12,5%), e della sanità e assistenza sociale (11,5%).

L'agricoltura nelle Aree Interne nonostante si scontri con non trascurabili ostacoli come il difficoltoso accesso alla terra dovuto in molti casi alla presenza dei cosiddetti terreni "silenti", ovvero parcelle di cui non si conosce la proprietà e di cui non si ha traccia degli eredi quale manifestazione dell'eccessiva frammentazione della maglia poderale (CREA, 2016; Iovino, 2018), può comunque godere di un vantaggio comparato (Bertolini, 2012). Il vantaggio è dato dalla presenza di produzioni agro-alimentari specifiche, *specialities* legate all'unicità dei caratteri territoriali, difficilmente riproducibili altrove o in circuiti standardizzati che sono in grado di offrire una diversità di offerta capace di rispondere a una domanda che va oltre le commodity indifferenziate (Barca, 2013; Meloni, 2013). Tale domanda è sempre più mutevole e diversificata, in coerenza con una sempre più forte modernità riflessiva (Giddens, 1991), e una conseguente attenzione di consumo (Lancaster, 1971) che non tralascia, nell' orientamento di mercato, la conoscenza dei contesti produttivi e dei relativi substrati agrari.

L'agricoltura delle Aree Interne si muove in una traiettoria di multifunzionalità in quanto si distingue per essere attività capace di generare – come esternalità positive – beni di club e *common pool resources* (Ostrom, 1990) di cui intere collettività possono beneficiare come la manutenzione dei boschi e la prevenzione del rischio incendi, la manutenzione di strade rurali e muretti a secco per la prevenzione del rischio idrogeologico, la salvaguardia e riproduzione della biodiversità, la co-costruzione del paesaggio, il miglioramento della qualità dell'aria, o la produzione di alimenti salubri (Oecd, 2001; Cois & Pacetti, 2020; Carrosio & Osti, 2018). Questa ampia sfera di produzione e erogazione prodotti e servizi multipli (es: servizi ecosistemi, servizi sociali connessi all'agricoltura, ecc.) contribuisce a ristrutturare su sinergie e contenuti nuovi il rapporto campagna-città (Horlings & Marsden, 2014). La multifunzionalità diviene quindi uno dei mezzi attraverso cui popolazioni rurali e popolazioni urbane mediano rispettivi interessi, richieste, bisogni e aspettative che nel rurale confluiscono. Non è un assoggettare le dinamiche dello sviluppo rurale ai bisogni della città ma una strategia per reimpostare a livello territoriale integrato sinergie e flussi di risorse che possano generare un beneficio condiviso tra l'urbano e il rurale. La transizione alla multifunzionalità – anche attraverso l'inserimento di nuovi e beni e servizi per il mercato (es: agriturismo, fattoria didattica, agricoltura sociale, ecc.) – è un tentativo endogeno

di riappropriazione di uno spazio-voce per la mediazione di interessi all'interno di un rapporto urbano-rurale che non sia solo estrattivo; un andare oltre sia la visione univoca della campagna quale "industria di manodopera per la città" (Braudel, 1992), sia la concezione dell' substrato agrario contadino quale gruppo indifferenziato, percettore passivo di dinamiche macro-economiche.

2. Scenari agrari in mutamento dentro la "ciambella": evidenze dal Centro Sardegna

Il processo di marginalizzazione che ha investito le Aree Interne soprattutto dalla seconda metà del XX secolo generando dinamiche di spopolamento, contrazione della produttività e rarefazione sociale, abbandono della terra e modificazione del paesaggio è noto per la Sardegna come "effetto ciambella" (si veda Bottazzi, 2014). La definizione di Bottazzi fotografa un'isola che vede la popolazione addensarsi sulla linea di costa creando il vuoto al centro dove si assottigliano il bacino dei servizi e i livelli di occupazione (Cocco *et al*., 2016). A tal riguardo, seguendo i dati Isat (2021), si nota che la distribuzione territoriale della popolazione evidenzia un significativo squilibrio tra alcune aree costiere – in cui si rilevano i più elevati valori di densità di popolazione – e le zone interne: nei 17 comuni della provincia di Cagliari – appena il 5% della superficie regionale – si concentra più di un quarto della popolazione, mentre i residenti nelle province di Oristano e Nuoro, che insieme coprono un terzo del territorio, sono poco più del 20% della popolazione regionale. Al Censimento del 1951, la provincia di Cagliari contava poco più di 200 mila residenti, con una densità di 164 abitanti per km^2; 68 anni dopo la popolazione è più che raddoppiata e la densità è salita a 339 abitanti per km^2, a fronte dei 67 abitanti per km^2 della media isolana (ibid.). I dati CNA Sardegna (2021) confermano questo panorama, rispetto agli anni Sessanta, il calo demografico dei comuni dell'interno è arrivato nel 2020 a più di 137 mila persone (-21%), mentre la crescita della popolazione residente nell'area costiera ammonta a 303mila persone (+40%). In altri termini, se nel 1961 la popolazione localizzata nei comuni dell'interno era pari al 47% del totale, nel 2020 questa è scesa al 33% con stime che sfiorano il raggiungimento del 29,7% nel 2050. Si nota inoltre che l'inarrestabile calo demografico dell'entroterra si sia tradotto in una perdita di ricchezza che si sostanzia – tra il 2012 e 2019 – in una diminuzione di reddito complessivo prodotto dai residenti dei comuni dell'interno pari al -4,2%, mentre si è ridotto in una percentuale minore per la popolazione costiera (-1,8%) (Ibid.). Tuttavia, nonostante la diffusione dei vuoti dello spopolamento e della rarefazione dei servizi, se ci si focalizza sui pieni degli scenari agrari locali, si nota che nelle Aree Interne dell'isola il numero medio di prodotti tipici (DOP e IGP) è di 15 prodotti, ci si colloca dunque come primi a livello nazionale per specificità-tipicità delle produzioni (CAIRE, 2014). Sebbene quindi vi sia un non trascurabile e allarmante depauperamento del capitale territoriale persistono produzioni specifiche (che vanno anche oltre la quantificazione delle produzioni certificate) radicate nell'unicità dei policentrici sistemi locali che sono manifestazione di sistemi di filiera attivi e di qualità.

Guardando ai contesti territoriali oggetto di studio (tab.1), nel caso della Barbagia-Mandrolisai si ha una spiccata e diffusa vocazione pastorale specializzata nell'allevamento ovino a pascolo brado che ha le radici nel sistema transumante – ormai in disuso – che per secoli era divenuto il mezzo di connessione tra comunità montane dell'interno e popolazioni di pianura (Murru Corriga, 1990; Le Lannou, 2006). Si associano la produzione vitivinicola (Meloni & Uleri, 2023), e le produzioni montane di pregio economico diretto come la castanicoltura (Campus *et al.*, 2013). Nel caso dell'Ogliastra invece – come segnalava già Le Lannou (2006) negli anni Quaranta – le produzioni ovi-caprine da allevamento estensivo con pascolo brado si concentrano soprattutto nei comuni di montagna (es: Arzana, Gairo, Talana), mentre il resto del territorio resta vocato all'olivicoltura, viticoltura e alle piccole produzioni orticole (Colavitti *et al.,* 2018). In Ogliastra cir-

ca il 60%[10] del territorio è interessato dagli usi civici, ossia dal diritto al godimento collettivo dei terreni per il pascolo e l'agricoltura e dei boschi; questa pratica nata in epoca medioevale, ha contribuito in maniera determinante a preservare l'integrità paesaggistico-ambientale locale (Liverani & Gallar Hernández, 2021).
È importante però segnalare che soprattutto tra gli anni Sessanta e Ottanta si attivarono in questi territori meccanismi di deagrarizzazione supportati da un avvento di industrializzazione dell'alto: in Ogliastra, dal 1962 la cartiera di Arbatax iniziò ad attrarre manodopera dai comuni montani affacciati sulla parte centrale del golfo di Orosei; lo stesso accadde con l'area barbaricina in seguito all'inserimento della piana di Ottana all'interno del Piano di Rinascita dell'isola (L. n. 588 dell'11 giugno 1962), finanziato dalla Cassa per il Mezzogiorno, nella previsione di strutturare un vasto progetto industriale basato sul lancio del settore petrolchimico (Zedda, 2021), dopo l'individuazione dei poli di Sarroch, Assemini e Porto Torres. Entrambe le iniziative, dopo decenni di farraginoso funzionamento, sono naufragate, tuttora si vacilla tra prospettive di riconversione e bonifica.

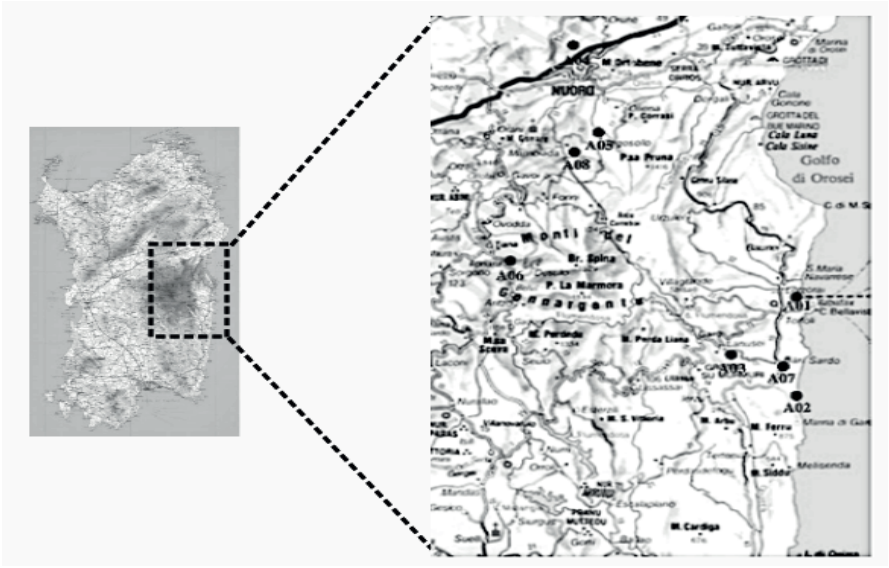
2.1. Giovani e agricoltura

Secondo i parametri stabiliti dalla SNAI le aree centro-orientali dell'isola si caratterizzano per una perifericità estrema con una perdita di popolazione pari al 13,9% nel periodo 1971-2011; le regioni storico-geografiche della Barbagia-Mandrolisai e Ogliastra, sono però anche i territori ove la «produzione agricola resiste come una realtà consolidata [...] in cui la perdita/frammentazione delle superfici agricole per abbandono e/o *urban sprawl* è più contenuta [...] rispetto a quella delle aree periferiche intermedie» (Colavitti *et al.*, 2018, p.129-130). La scelta dei giovani di fare impresa in questi territori rappresenta in ogni caso un meccanismo di rivalutazione/risignificazione (Uleri & Elsen, 2023) delle peculiarità del territorio secondo un'accezione endogena dello sviluppo locale che costituisce un rovesciamento del precedente atteggiamento della modernizzazione rispetto alla molteplice unicità del locale (Magnaghi, 2000).
Nel gruppo di intervistati a fini dello studio, l'età media dell'ingresso in agricoltura è 27 anni e nella metà dei casi si registra una tradizione familiare alle spalle (tab.1). Numerose ricerche a livello internazionale (si veda ad esempio Widiyanti *et al*., 2020) segnalano che i genitori o membri vicini della famiglia hanno un importante ruolo nell' incoraggiare il subentro dei giovani nell'attività agricola. Vi è da segnalare però che questo "incoraggiamento/indirizzo" non è temporalmente circoscritto ai tempi immediatamente precedenti al subentro nella conduzione aziendale, non è cioè una richiesta razionale e direttamente espressa di dar continuità alla realtà aziendale ma è un processo inconscio che si realizza nel lungo periodo in connessione al normale svolgimento della vita familiare e attività aziendale (e interna divisione del lavoro), quali sfere difficilmente separabili e altamente interdipendenti.

10 Dati Piano d'Azione GAL Ogliastra.

Tab. 1: Collocazione geografica aziende e profili aziendali

Collocazione geografica aziende



Profili aziendali

	Azienda **A01**	**A02**	**A03**	**A04**	**AO5**	**AO6**	**AO7**	**AO8**
Territorio	Ogliastra	Ogliastra	Ogliastra	Barbagia	Barbagia	Mandrolisai	Ogliastra	Barbagia
Comune	Girasole	Cardedu	Lanusei	Lollove (fraz. Nuoro)	Orgosolo	Tonara	Barisardo	Mamoiada
Età ingresso in agricoltura	29	26	23	31	32	21	26	27
Sesso	F	F	M	M	F	F	F	F
Ambito produttivo	Coltivazione zafferano; Produzione olio di lentischio; agricoltura sociale	Olivicoltura; viticoltura; lavorazione conto terzi (molitura olive, imbottigliamento e confezionamento olio); turismo esperienziale (es: laboratori di degustazione); attività fattoria didattica	Orticoltura; frutticoltura; olivicoltura; allevamento ovino; apicoltura	Orticoltura; olivicoltura; allevamento ovino e caprino; agriturismo; attività fattoria didattica	Olivicoltura; allevamento bovino	Castanicoltura; agricoltura sociale	Orticultura (con particolare attenzione a recuperare antiche varietà locali e con ridotta idro-esigenza	Viticoltura; turismo esperienziale (es: visite in azienda; degustazioni guidate
Titolo studio	Diploma artistico	Diploma ragioneria; attualmente iscritta in Giurisprudenza	Diploma Socio-psico-pedagogico	Laurea Triennale in Economia	Laurea in Belle Arti	Diploma agrotecnico; attualmente iscritta in Scienze Forestali e Ambientali	Diploma Socio-psico-pedagogico	Attualmente iscritta in Scienze Politiche
Tradizione familiare diretta	NO	SI	SI	SI	NO	NO	NO	SI
Agricoltura principale fonte reddito	NO	SI	SI	SI	SI	SI	SI	SI

La latenza del processo – come richiesta non immediatamente espressa a livello familiare – soprattutto quando l'azienda passa di padre in figlia/figlie genera spesso stupore e incredulità, non solo a livello aziendale ma anche di comunità:

> *'C'è una tradizione familiare. Prima di noi nostro padre; prima di lui nostro nonno, facevano questo come lavoro principale. Per nostro padre era come se fosse la sua vita. Nel senso che lui ancora oggi guarda i vigneti come se fossero i suoi figli. Forse il suo più grande "malumore" è l'aver avuto tre figlie femmine e un po' il figlio maschio gli è mancato. La nostra azienda vuole essere la dimostrazione di, perché no? tre donne in agricoltura? Perché non far portare avanti la tradizione di famiglia da tre donne?* [...] *già alle superiori andavamo ad aiutare babbo quando c'erano lavori da fare come impalcare, ecc.. Nostra sorella maggiore quando perse un anno alle superiori fu obbligata da babbo a passare tutta un'estate in vigna e seppur all'inizio lo reputasse un odio mortale alla fine si è legata a questo mondo. È stata una beffa* [sorride]. [...] *Il vino è donna"* [...] *è la nostra frase di battaglia in quanto ci auguriamo di dimostrare che il vino dei nostri tempi è anche donna e non più solo uomini.* [...]. *Ci è capitato, proprio all'inizio dell'attività, quando la società stava per nascere, che un altro viticoltore venne a casa di nostro padre per chiedere a lui di vendere i vigneti perché con tre figlie femmine la cosa non sarebbe andata avanti ma mio padre lo stupì dicendogli che avevamo l'idea di andare avanti noi. Nostro padre ci dà una mano in qualsiasi cosa, e in tutto ciò lui non vuole mollare. Una delle cose che non facciamo è potare e gli abbiamo chiesto d'insegnarcelo ma si è sempre rifiutato attribuendoselo come un proprio compito.* [...] *all'inizio era un po' spaventato poiché lui ha sempre solo coltivato e prodotto vino sfuso, mai imbottigliato come invece facciamo noi ora,* [...] *chiudendo la filiera'* [Int. A08, Mamoiada].

> *'Io dieci anni fa ho intuito che ci sarebbe stato un "ritorno all'agricoltura" e adesso sta accadendo.* [...] *questo territorio ha una forza incredibile,* [...] *abbiamo il mare, non abbiamo inquinamento e se ti giri qua intorno è tutto vigneti.* [...] *le vendemmie le ho sempre fatte e ci hanno sempre insegnato a curare l'orto* [...] *ci hanno abituato a sporcarci le mani. Poi credo che qualcuno lo doveva fare* [prendere in mano l'azienda]. *Mio fratello è enologo ma ha la sua vita a Cagliari. Mia sorella è dentista ma qualcuno in un modo o nell'altro lo doveva pur fare! Io vivevo a Cagliari, studiavo giurisprudenza però i genitori ci hanno sempre trasmesso tale passione per l'agricoltura. Noi siamo sempre tornati qua tutti i fine settimana della nostra vita. All'inizio era molto pesante però penso che ad una certa età prevalga il senso di responsabilità per prendere in mano l'azienda'* [Int. A02, Cardedu].

Come segnala Cersosimo (2012) la famiglia rimane in molti casi il cardine decisionale e la forma regolativa esclusiva di produzioni, pratiche lavorative e conoscenze tecniche (Corsi, 2005), all'interno del quale soprattutto il padre – che risulta spesso intestatario dell'azienda – si rivela un insostituibile "avversario di sostegno" per la crescita imprenditoriale dei figli. Dal canto loro i figli, con il subentro nella gestione aziendale, sostengono il rinnovo imprenditoriale non solo da un punto di vista generazionale – coerentemente alla logica di riproduzione dell'unità produttiva contadina (Chayanov, 1966) – ma anche da un punto di vista di innovazione emergente dalla capacità di intercettare, comprendere, e mediare nuove domande, alimentata dalle esperienze fuori dalla sfera familiare e dal contesto territoriale di appartenenza (es: periodi di formazione universitaria).

Per ciò che concerne invece i newcomers, l'arrivo per la prima volta in agricoltura rappresenta una "prima scelta" e non una "scelta di ripiego" nella maggioranza dei casi aziendali (sette su otto). Questa è determinata dalla possibilità di avere potere decisionale e autonomia sulla gestione del proprio lavoro e dalla possibilità di poter vivere in territori contraddistinti da una bassa densità abitativa e da importanti risorse ambientali e culturali fortemente diversificate. Il territorio stesso è dunque driver primario degli arrivi in agricoltura che spesso si accompagnano a un ritorno sul territorio dopo periodi passati in altri contesti (es: urbani per motivi formativi, ecc.).

Il confronto con contesti sociali differenti, e la permanenza temporanea all'esterno del proprio paese, costituisce uno degli elementi che anima la costruzione (sociale) nuova della ruralità delle "campagne difficili" le quali si iniziano a vedere ora come contesti dotati di vantaggi comparati specifici (es: accessibilità dell'abitare a costi ridotti; il vivere in ambienti scarsamente inquinati; ecc.) rispetto ad altri sistemi come quelli urbani, di cui è fatta spesso esperienza. Nella costruzione e risignificazione del rurale centrato sull'azione dell'azienda agricola quale filtro tra locale ed "esterno", la campagna non viene impostata come luogo di consumo da parte di gruppi urbani, ma semplicemente come luogo capace di offrire servizi differenti, irriproducibili altrove, animati però primariamente dal rapporto produzione-riproduzione interna degli input, dato anche dal

recupero e cura dei terreni abbandonati (Sevilla Guzmán & González de Molina, 1990), che contribuiscono a garantire sostenibilità del "fare agricoltura e impresa" in lungo periodo:

'Alla base di tutto [scelta di ritorno] *c'è la necessità di avere nella vita la natura e l'enogastronomia, essendone io un'amante. Per raggiungere quella qualità di vita che cercavo, ho sentito la necessità di dare un senso ai terreni* [familiari] *che contrariamente sarebbero rimasti abbandonati* [...] *dedicarmi a una filiera* [...] *con un'alta qualità* [...]. *L'azienda è nata con i miei nonni, nonno di Fonni e nonna di Orune che hanno trovato sede in questo piccolo paese chiamato Lollove, un paese di 13 abitanti oggigiorno ma che negli anni che furono era arrivato a 500 abitanti. Mio nonno e mio zio sono sempre stati dei pastori e io ho vissuto tutte queste cose nella mia adolescenza, che poi ho ripreso circa due anni fa come sono tornato in Sardegna, a Lollove. Una volta dopo aver finito di studiare economia a Cagliari sono uscito fuori tra Sudafrica, America e quant'altro e poi sono tornato* [...]. *Cercare di fare impresa è già difficile, soprattutto se decidi di farlo in un contesto svantaggiato. Questo può essere sia uno svantaggio che un vantaggio. Io cerco di vederlo come un'opportunità e vedo la scarsa densità di popolazione come una caratteristica per renderci unici. Ad esempio, la totale assenza di segnale telefonico* [...] *può essere talvolta un fattore unico se ben indirizzato* [...] *cerco di vedere in tutto ciò un'opportunità. Noi cerchiamo di far vivere direttamente la qualità nel senso che agli ospiti che vengono da noi non somministriamo solo cibi e bevande ma cerchiamo di renderli partecipi della quotidianità del villaggio e dei processi produttivi'* [Int. A04, Lollove].

'*Nel momento in cui abbiamo deciso di portare avanti quest' azienda non solo con la coltivazione, ma inserendo pure la pastorizia e l'apicoltura, abbiamo il progetto di poter ospitare delle famiglie e far vivere loro la nostra quotidianità. Trasmettere loro quello che in una città difficilmente si vede* [...]. *Noi abbiamo la fortuna di avere questi terreni sia pur scoscesi, messi male, però sono in una posizione che ci permette di produrre qualità. Ti spiego, il mare, noi siamo circondati dal mare e dalla montagna e tutto questo ci aiuta; Credimi! Il prodotto cambia letteralmente. Ciò vale sia per il sapore dei prodotti dell'orto che per il latte. È la zona in cui viviamo che ci permette di avere tutto ciò*' [Int. A03, Lanusei].

L'unicità di ogni singola dimensione territoriale è motivo stesso di arrivo in agricoltura per i giovani privi di una tradizione agricolo-aziendale alle spalle:

'Innanzitutto vi è l'ambiente. Siamo a mille metri e abbiamo aria sana, l'acqua è buona, c'è il sole, i boschi, il paesaggio. Nella mia idea di azienda, dopo l'università, miro a introdurre altre attività che riguardano proprio il turismo, la fattoria didattica e già ora faccio fattoria sociale. [...] *Mio padre aveva un orticello, ma solo come hobby non come lavoro, l'attività che ho intrapreso è un altro mondo, perché ho un'azienda e mi occupo prevalentemente di castanicoltura* [...]. *Con tutte le passioni che ho, stavo per prendere un'altra strada ma all'ultimo ho detto "No! Io voglio stare nella mia terra e nel mio territorio che offre tantissime risorse, in stato di abbandono". Non è che non ci sia lavoro: ci vuole una ferrea volontà per riprendere in mano quello che è abbandonato. Le mie motivazioni sono state queste: stare nel mio territorio, cercare di creare economia, essere d'esempio per altri giovani al fine di trasmettere questo messaggio, non dico che poi tutti debbano fare agricoltura'* [Int. A06, Tonara].

Da sottolineare però che la mancanza della connessione agricolo-aziendale a livello intergenerazionale familiare è in certi casi l'elemento che causa una differente e contrastante significazione del rurale e della dimensione agricola tra generazioni familiari. Nel caso dei padri si tende a proiettare nel presente un'immagine dell'agricoltura delle Aree Interne come attività scarsamente remunerativa non orientabile a divenire fonte principale del reddito domestico; nel caso dei figli ci si pone dal lato opposto come in un asse polarizzato dove, consci della crisi e della precarietà del mondo industriale e dell'urbano quale spazio in cui è sempre più forte l'aumento delle disuguaglianze sociali (Secchi, 2011), si riattribuisce valore allo spazio fisico e al tessuto sociale rarefatto e abbandonato quale base in cui individuare risorse da attivare per intraprendere una via imprenditoriale stabile. In una prospettiva Hirschmaniana (Hirschman, 1958) si nota una riattivazione di risorse "dormienti" o latenti nel corso d'azione della precedente generazione, data anche dall'emergere di nuove domande e dal conseguente incontro e dialogo tra aziende agricole e bacini di consumo differenziati (Lancaster, 1971):

'la famiglia l'ha percepita [in riferimento all'entrata in agricoltura] *come una scelta pericolosa e sprovveduta. Soprattutto i parenti non l'hanno vista come una scelta opportuna e hanno tentato di scoraggiarci. Mentre la clientela era piuttosto contenta e tranquilla perché un'azienda agricola che producesse verdure biologiche e certificate mancava. Sicuramente adesso* [a distanza di cinque anni dall'avvio] *sono tutti tranquilli. Hanno capito che è il nostro lavoro e come tale lo trattano e non ci propongono più lavori alternativi'* [Int. A07, Barisardo].

'*I Gruppi d'Acquisto Solidale non sono tantissimi in Sardegna. Io fornisco Cagliari, Oristano e Nuoro. Ce ne sono anche a Sassari e a Bosa ma lì non ci sono ancora arrivata perché generalmente finisco tutto il prodotto* in tempi brevi' [Int. A06, Tonara].

Nel gruppo di aziende intervistate, la capacità di rispondere a nuove domande si articola attraverso:

(i) la localizzazione e territorializzazione delle produzioni date dal recupero di varietà locali e connesse pratiche produttive e di consumo;
(ii) l'offerta di nuovi servizi radicati nel capitale territoriale e rispondenti sia a esigenze locali che extra-locali, come l'agricoltura sociale, la fattoria didattica, e l'agriturismo;
(iii) il ribilanciamento/ristrutturazione della connessione territoriale Aree Interne-città.

L'azione dei giovani agricoltori non è quindi orientata necessariamente a strutturare filiere capaci di competere a livello globale, bensì economie rurali capaci di trattenere valore aggiunto in loco 'con la trasformazione dei prodotti nella zona stessa e con la vendita di prossimità, attraverso le filiere corte, le nuove forme di mercati locali e di organizzazione collettiva degli acquisti dei prodotti alimentari (GAS, CSA)' (Cavazzani, 2019, p. 180). La presenza di – e la connessione a – GAS animati soprattutto da consumatori delle aree urbane sarde (Counihan, 2019) non demarca però un localismo contraddistinto da un processo di "*commodification of territoriality*" (ibid.) bensì la strutturazione critica di un corso d'azione dove il localismo si pone come una parte di un effettivo movimento sociale di autonomia e resistenza rispetto a un globalismo dei sistemi di filiera e di governance delle stesse, e ai loro effetti sul livello micro (es: "*cost-price squeeze*") (DePuis & Goodman, 2005).
Si generano inoltre un insieme di servizi non commodity di cui ampie collettività territoriali possono beneficiare; tutte le aziende intervistate dichiarano di svolgere servizi quali la (i) manutenzione siepi e alberature aziendali tenendo conto dell'estetica del paesaggio, (ii) la manutenzione e ripristino strutture aziendali e strade campestri tenendo conto dell'estetica del paesaggio, (iii) la manutenzione dei canali di scolo delle acque, e serbatoi di recupero delle acque piovane e di scolo; (iv) la riduzione dell'uso di fertilizzanti, pesticidi e altre sostanze chimiche per salvaguardare le falde acquifere; mentre quasi la totalità di loro (valore assoluto: 7) dichiara di occuparsi della (v) gestione e manutenzione di muri a secco nel perimetro aziendale. Sono azioni proprie di un' agrarizzazione nuova che congiuntamente rientrano in una traiettoria di innovazione territoriale in quanto ricercano di sostenere «efficienza, attrattività e competitività di un sistema locale attraverso la promozione di attività sostenibili, contrastando il consumo di risorse, la dispersione insediativa e promuovendo difesa del suolo, del paesaggio, dell'identità territoriale, della qualità della vita per le comunità locali presenti e future» (Battaglini, 2019, p. 92).

3. Riflessioni conclusive e indicazioni di policy

Il ritorno alla terra dei giovani provenienti da esperienze urbane, o il rimanere per coloro che sono nati in contesti agricoli, può assumere una valenza nettamente politica in tutti quei casi nei quali vi è dichiaratamente la volontà di promuovere attivamente un movimento di riagrarizzazione alternativo a quello proprio del paradigma della modernizzazione e della logica agro-industriale (Rossi, 2017; Elsen, Fazzi, 2021). Più spesso, tuttavia, si tratta di una scelta di convenienza economica, che assume potenzialità trasformativa in virtù degli impulsi offerti anche dai consumatori (Forno, 2019). L'alleanza tra consumatori e produttori per garantire sostenibilità economica e dignità al lavoro agricolo ha mostrato le sue potenzialità proprio nei difficili anni della pandemia da Covid-19 (Piccoli *et al*., 2021). Le potenzialità della relazione consumatore/produttore andrebbero indagate in modo più approfondito, soprattutto per contribuire a indirizzare le politiche di contrasto allo spopolamento, all'abbandono del territorio e al ribilanciamento dei rapporti urbano-rurali. Se infatti durante l'espandersi del paradigma della modernizzazione il

rapporto rurale-urbano veniva analizzato in termini oppositivi e dicotomici, oggi il futuro delle Aree Interne è strettamente legato a quello delle città, nel tentativo di superare la statica contrapposizione tra il rurale e l'urbano.
Le due sfere, pur avendo caratteristiche radicalmente diverse, sono complementari tra loro e quindi possono stabilire connessioni reciprocamente vantaggiose (Barbera & De Rossi, 2021). Come detto, la campagna rurale dà alla città beni con un buon grado di non sostituibilità, beni e servizi eco-sistemici, idrici ed energetici, spazi di attraversamento delle grandi infrastrutture, una parte consistente del patrimonio fondiario e di quello architettonico tradizionale, la qualità delle produzioni alimentari locali, la cura dell'ambiente e del paesaggio fruito dagli abitanti della città o la cura del territorio che protegge le città pedemontane dal rischio idrogeologico e idraulico. La campagna rurale riceve dalla città più vicina input di importanza vitale, dipendente per i servizi necessari quali ospedali, istruzione superiore, offerta commerciale specializzata, amministrazione e gestione pubblica sovralocale, flussi di visitatori e villeggianti sono inoltre in molti casi il principale sostegno dell'economia locale[11].
Oggi più che mai è quindi necessario comprendere il senso di questa possibile evoluzione recente del rapporto Aree Interne e città medie, guardando in modo specifico alle nuove generazioni di agricoltori che in molti casi hanno esperienze di vita in entrambi i contesti (es: permanenza prolungata in città per motivi di studio). Le città medie in tutta Italia sono molto importanti dal punto di vista demografico e produttivo, basti pensare alla campagna urbanizzata quale elemento storicamente qualificante della terza Italia (Sciarrone, 2020). Va delineandosi una potenziale e nuova convergenza di interessi tra interno e costa, o tra campagna e città media, o ancora tra montagna e pianura nell'ottica del reciproco vantaggio e delle potenzialità di innovazione insite in una modalità di regolazione solidale dei rapporti (De Rossi, 2018). Pertanto sebbene lo studio dei movimenti neo-rurali – ivi compreso il ritorno alla terra dei giovani – debba necessariamente tener conto di moderne crisi urbane e dei sistemi industriali, da un punto di vista analitico non ci si pone in una prospettiva di antiurbanesimo, citando Cecchini (2022, p. 21) «l'ideologia antiurbana è sempre stata reazionaria (come anche il disprezzo per i contadini […])[…]. Con circa dieci miliardi di abitanti previsti al 2050 essere antiurbani è tecnicamente impossibile».
Da un punto di vista delle politiche, vi è quindi l'esigenza di indirizzarsi verso una regolazione solidale dei rapporti di prossimità tra città medie e costellazione dei centri rurali circostanti attraverso la costruzione di una linea di intervento che connetta diritti di cittadinanza, attenzione ai servizi essenziali, e attenzione alle risorse e specificità locali.
Parallelamente, tenendo conto del cuore del nuovo processo di agrarizzazione che sta diffusamente interessando le Aree Interne – la multifunzionalità – vi è importanza di riconoscere il ruolo dell'impresa agricola multifunzionale, individuando specifiche modalità di compensazione economica per la vasta gamma di "beni pubblici" associati alla produzione di alimenti (ambiente, risorse naturali, paesaggio, tutela e gestione del territorio, benessere animale ecc.). Molti dei beni prodotti dalle realtà dei giovani agricoltori intervistati sono esternalità prodotte in "maniera inconsapevole", pertanto uno degli obiettivi delle politiche dovrebbe essere continuare a trasformare l'esternalità positiva in obiettivo consapevole. Questo vale soprattutto per: (1) i servizi verdi, quali forme variegate di gestione della natura, della biodiversità e del territorio, strategie di manutenzione per garantire estetica e funzionalità, produzione di energia alternative, riproduzione della biodiversità, benessere animale, sicurezza alimentare; e (2) per la valorizzazione del paesaggio rurale, nonché il rapporto coerente tra le comunità locali e il paesaggio come prodotto dell'interazione antropica e i sostrati naturali. L'attuazione del progetto paesaggio richiede centralità della multifunzionalità dell'agricoltura (Agnoletti, 2011), presupponendo – oltre che un riconoscimento della risorsa stessa – un'idea di "tutela attiva" restituita alle comunità locali.

11 Questa sezione riprende in maniera approfondita e contestualizzata al caso studio l'analisi sulla connessione tra i temi Aree Interne, agricoltura multifunzionale e neo-popolamento sviluppata da Benedetto Meloni nella sezione "Centro in Periferia" dell'Istituto Euroarabo di Mazzara del Vallo. Materiale reperibile al link: http://www.istitutoeuroarabo.it/DM/aree-interne-e-agricoltura-multifunzionale-il-neo-popolamento/.

L' unicità del territorio e l'attribuzione di un valore potenziale alle sue risorse guidano le scelte dei giovani di ritorno o arrivo per la prima volta in agricoltura, ne sono motivazione primaria. Come emerge dalle interviste, a differenza della generazione dei padri si ricentrano le prospettive imprenditoriali su risorse che precedentemente non venivano riconosciute e tutelate. Le risorse (es: naturali, sociali, insediative, ecc.) risultano infatti non essere adatte a qualsiasi circostanza, questo porta ad avere risorse potenziali spesso "dormienti" o magari semplicemente inadatte a tempi specifici che riaffiorano invece come centrali in altri (Bagnasco, 1988). La tutela e la riproduzione di risorse e unicità territoriali da parte delle nuove generazioni di agricoltori potrebbero essere supportate dall' attribuzione esplicita di un ruolo attivo e formalmente riconosciuto alle aziende agricole ad esempio attraverso strumenti come i contratti di responsabilità per vigilanza e manutenzione a livello municipale. Vi è infine l'inevitabile necessità di valorizzare il sistema insediativo attraverso l'ampliamento di misure di agevolazione fiscale che permettano ai giovani di supportare le spese connesse all' acquisto o al recupero individuale di immobili o per la promozione di interventi di recupero del patrimonio insediativo che abbiano alla base forme associative e/o di cooperazione tra giovani e che prevedano la residenzialità almeno per un numero minimo di anni.

Congiuntamente queste azioni consentono di focalizzare e valorizzare le scelte e le esperienze di riagrarizzazione animate dai giovani delle Aree Interne all'interno di un sistema multi-livello, multi-attore e multi-settore di ridefinizione e bilanciamento delle interconnessioni e interdipendenze tra centri e aree "periferalizzate" nel tentativo di contenere e contrastare dinamiche di spopolamento e rarefazione sociale e produttiva. È in sé un tentativo di riappropriazione di uno spazio collettivo per la co-costruzione endogena di soluzioni localmente radicate a problemi locali, non sempre omogenei tra territori. Bisogna infatti dare conto del policentrismo proprio delle Aree Interne, di più centri e più periferie, di diversi livelli di scala coinvolti, di differenti gradi di integrazione e interconnessione tra gli stessi (Sciarrone, 2020). Ciò implica la transizione verso un paradigma di sviluppo in cui "la riagrarizzazione del ricambio generazionale" non crea una rottura con i vecchi modelli contadini (differentemente dal paradigma della modernizzazione che ne prevedeva una conversione/eliminazione) bensì su essi si innesta proponendo un mutamento (es: multifunzionalità orientata al mercato) in continuità e coerenza con vocazioni produttive specifiche altamente localizzate; si ambisce così a coniugare l'impatto economico con la sostenibilità ambientale e la responsabilità ampia verso il territorio e la società (Barbera, Parisi, 2019).

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