

Special Issue Future of Smart Cities

FUORI LUOGO

Rivista di Sociologia
del Territorio, Turismo, Tecnologia

Guest Editors

Monica Bernardi

Luca Bottini



Direttore Fabio Corbisiero
Caporedattore Carmine Urciuoli

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Climate change and social inequalities: the gap between climate solutions & environmental justice²

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.

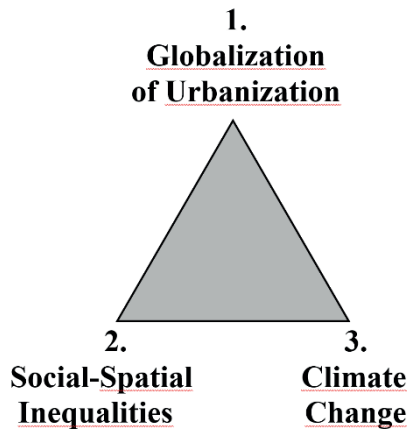
However, as highlighted by Bergamaschi and Lomonaco (2022), this process, which affects territories and cities at a global scale, does not result in a spread of homogeneous and smooth spaces. On the contrary, "territorial differences within and between cities do not disappear; if anything, urban contexts 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 involvement 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 territory.

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 homeownership 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 and 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 about 18.000 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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