



A Small Slow and Street Approach to Research

Seeking justice in the risk landscapes of Gela,

a Sicilian petrochemical town

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ABSTRACT

This thesis challenges the mainstream approach to research and planning in risk landscapes by proposing “a small, slow, street-approach” (SSS). Stemming from the definition of the landscape by the European Landscape Convention as “an area as perceived by people whose character is the result of the action and interaction of natural and/or human factors” (Council of Europe 2000, 2), risk landscapes (or riskscapes) can be considered a privileged conceptual tool through which one can read the uncertain and unjust socio-ecological relationships due to the current risk society.

Specifically, this thesis provides a re-signification of industrial risk as an emblematic example of slower-burning issues (Mah 2017) and slow disasters (Knowles 2014). Industrial risk and potential damage, such as toxicity and contamination, are never locationally limited and discrete – in terms of both time and space – but always invisibly and violently diffused into human and nonhuman communities living in and shaping landscapes.

After a comparative analysis on the construction of risk knowledge, cross cutting political ecology, environmental humanities, and environmental justice studies, the failings of the current mainstream planning approach and legal frameworks on risk landscapes are found to occur because they are mainly based on techno-driven solutions, and quantitative, big, and objective data. As an alternative, the thesis proposes to build planning of riskscapes upon “a small slow street approach” (SSS).

Small data have been defined (Privitera, Armiero, Gravagno 2021) as the ensemble of information – perhaps they might be called “stories” – embodied into the texture of life of human and non-human communities. Some of these stories are told by humans, e.g., the toxic autobiographies, some inscribed into the environment. Toxic autobiographies are stories produced by people who have encountered contamination during their lives (Armiero et al. 2019). These autobiographies regard the everyday relationship between human and non-human bodies with contamination (stench, pollution, waste, diffuse illnesses, and devastated landscapes) and seek to co-produce a counter-hegemonic narrative

The differences between small and big data are epistemological, “ethical,” and methodological. While big data are recurring, generalised, impersonal, and fast, small data are discrete, specific, personal, and need time. While big data can be collected through technological devices, small data arise through “street science”, emotional and sensorial experience. Small data and toxic autobiographies enable the understanding of the unjust relationships of places transformation.

SSS approach aims at “slowing down” science both epistemologically and methodologically. The first means that researchers should engage openly and honestly with the public, to develop a collective awareness and learning process on “matters of concern”. This leads to the second feature regarding

the importance of conducting research by "paying attention" and taking time, in qualitative and relationship terms, more than in quantitative terms. Only by doing so can it be possible to catch street science and small data

This work aims to argue that SSS is appropriate for a contaminated area with high and slow environmental risk at least for three reasons: (1) SSS intercepts the socio-economical-environmental connections underlying risk landscapes and their slow and diffuse transformations over time and space; (2) SSS leads to uncovering the power imbalance and the injustice shaping the landscapes, including humans and more-than-humans; (3) SSS is consistent with the epistemological current seeking to create an extended peer community that uses "extended facts".

To discuss the potentialities of a SSS approach in the planning field, the thesis presents the results of an empirical case study in Gela, a Sicilian town converted into one of the main Italian petrochemical poles in the 1960s by a multinational oil company. The author analyses Gela's risk landscapes through the perceptions of citizens and their initiatives to tackle environmental injustices. The thesis analyses small data as entry points in four different fields: memories of injustice, memories of smell, trans-corporeal stories, and relational stories. The intense (slow and street) fieldwork has allowed the author to map the cartography of the diverse forms of environmentalism in Gela and to see the socio-ecological connections linking contamination, power, bodies, and memories in Gela's riskscape, revealing the inadequacy of the current Italian law, the used planning tools, and the quantitative approach that takes into consideration only discrete and punctual damages. Finally, the dissertation shows how SSS has potential for the coproduction to produce knowledge and for planning to enhance the collective reversion of unjust trajectories of development.

Preface

A personal account toward Gela: trespassing disciplines, contaminating¹ forms of knowledges and embodying lived experiences²

The Personal is Political (Hanisch 1970)

The Personal is Scientific (McCormick et al. 2003)

The Scientific is Political (ibidem)

I am an architect and civil engineer by training, I specialize in community urban planning, and I am a young scholar by passion and work.

I am of Sicilian origin.

Despite having spent several years of my training and research abroad (in Malta, Czech Republic, Germany, Spain, Japan, Sweden...most recently the United States!), in the end, similar to the functioning of a spring, I have always returned to my homeland.

It is an intense and poignant relationship of *odi et amo* difficult to explain but that many Sicilians know quite well. It is a matter that often (not always!) outside of Sicily things just work better: public transport, bureaucracy, cleaning of public spaces, just to give a few examples and, above all, there is more and better paid work, there is more lawfulness, and a higher quality of life. It is no coincidence that in Sicily the youth

¹ In Italian language the word “contamination” has a double meaning. It has a negative meaning when it indicates -just like in English language- “the process or fact of making a substance or place dirty or no longer pure by adding a substance that is dangerous or carries disease” (from Oxford dictionary). It has a more positive meaning when it means “blend/ fusion/ exchange/ interaction”. In this text I will apply the word “contamination” with this double meaning, despite in English it has almost exclusively the first negative interpretation.

² This chapter is in part a reworked and translated in English excerpt of the following publication: Privitera E. (2021b), “Contaminazioni. Dall’ambiente ai saperi (e ritorno): ermeneutica di un’esperienza di ricerca nei paesaggi del rischio di Gela” (IT) [tr. “Contaminations. From the environment to the knowledges (and return trip): hermeneutic of a research experience in the risk landscapes of Gela”], in Benadusi M., Lutri A., Saija L. (ed.), *Si putissi. Riappropriazione, gestione e recupero dei territori siciliani*, Catania: Editpress, pp. 75-114

emigration rate has been increasing for decades and reached a peak of 264% in 2019 when more Sicilians emigrated than those who stayed in Sicily³.

After all, there is always something more in the South of something else, and Sicily is exactly that South of the World nestled in the Western North world. The problems of Sicily and more generally of Southern Italy have become the object of a widespread negative perception. This is the basis of a line of thought with animated political and academic debates relating to what is called the "southern question"⁴.

This is how I grew up in Sicily, interested in the themes of the environment, anti-mafia, civic commitment while navigating in this continuous tension between a visceral bond with my land, plagued by a thousand problems but also animated by infinite possibilities.

All these are contradictions that seem to be concentrated in Gela, one of the oldest Greek colonies at the time of Magna Graecia when was named *Gheloï*, then converted into one of the biggest petrochemical towns in Italy when oil was found in the seabed of the Gulf of Gela in the 1950s and a refinery –nicknamed by residents “*u stabilimentu*”⁵- was built pretty close to the town. Over half a century the petrochemical industry has exploited the crude oil discovered in the Mediterranean Sea and hosted several productive activities such as fertilizers, plastics, gasoline, gas and lubricating oils, coal, caustic soda, sulfuric acid, and other chemical products.

Located on the Southern coast of Sicily, in front of Africa, in the common sentiment and among the Sicilians, Gela is defined as a “horrible place”. In the mainstream account Gela is unsafe due to the bloody mafia wars⁶,

³ Source:

https://palermo.repubblica.it/cronaca/2019/10/25/news/piu_emigrati_che_residenti_alla_sicilia_il_record_delle_partenze-239407494/

⁴ The historic perception of the situation of persistent backwardness in the socio-economic development of the Southern Italian regions compared to the other regions of the country, especially the Northern ones- has amplified after the unification of Italy (1861) and has generated a rich and heated debate that has got the label of “questione meridionale” (the Southern question). This divide has been characterized by the popular uprisings of the Southern peasants asking for more equity and less taxation, to which the State answered by mostly using repression at the beginning, and top-down and economic centralized decisions later. While the divide apparently smoothed over the 20th century, it is relevant noting that in Southern regions both criminality and poverty still have a higher rate than in the North, revealing how all the applied public policies and actions were not effective (ISTAT 2020).

⁵ “U stabilimentu” is a Sicilian dialectal word that can be translated into “the factory” or “the plant”. This nickname shows how the local community has considered for a long time the petrochemical as the factory par excellence and by definition of the area of Gela.

⁶ Notes about mafia war in Gela. I would add here a short note with some "quick and dirt" reference to newspaper articles

of which it has been the scene for more than two decades; aesthetically ugly due to its abusive and out of control urban development that has marred the landscape; environmentally contaminated due to the presence of an industrial giant such as ENI for seventy years; socially degraded due to its high rate of poverty and destitution; culturally underdeveloped also due to its geographical marginality compared to other Sicilian cities.

The ontological condition of Gela's exceptional nature and backwardness was one of the main justifications used by the manager of ENI (at the time ANIC⁷), Enrico Mattei to convince both the local and national institutions to allow ENI. The official story that was pounding in local and national TV and newspapers in those years was that "the black gold" could bring well-being -in its most consumerist meaning- to that very poor backward place! Oil could finally reduce the gap between Northern and Southern Italy. It could have been that *deus ex machina* solver of this atavistic gap. The construction of a petrochemical plant in Gela could represent the fly-wheel for its local economy and perhaps for the whole of Sicily. These narratives and beliefs were the result of Enrico Mattei's push for the expansion of ANIC's production activities and were married and accompanied by national public strategies and investments in the construction of large industrial development poles that should have become a driving force for the local economy. Soon, however, the hopes and promises vanished and within a few decades it was clear that the construction of "cathedrals in the desert"⁸ was failing to produce any kind of cascade effect. Indeed, the presence of the pole seemed to exacerbate social conflicts and brought with it a whole series of environmental and health problems that have made Gela considered the litmus test of the problems of southern Italy. Eyvind Hytten and Marco Marchioni (1970) have recognized Gela as emblematic of "industrialization without development" to highlight the limits of development based on accumulation rather than on the distribution of goods, on the concentration of power and opportunities, and on the further marginalization of the community rather than on greater participation in public life.

It is perhaps for these reasons that I met Gela in my personal and professional life, after it remained for a long time on the periphery of my thoughts and attention.

To be exact, I passed it once, at the beginning of the 2000s in my camper, from the central square full of men with "flat caps" who were idling, immersed in a sort of parallel temporal dimension. My father told us that an anti-mafia mayor had recently arrived in Gela who was risking his life and that he even had a bodyguard. He

⁷ ENI is the acronym of Ente Nazionale Idrocarburi (National Hydrocarbons Authority). It is considered one of the seven "Supermajor" oil companies in the world. ANIC is the acronym of Azienda Nazionale Idrogenazione Combustibili (National Fuel Hydrogenation Company), an Italian chemical company, established during the Fascist regime with the objective of obtaining synthetic gasoline by hydrogenation of brown coal. It was set up in 1936 by state-owned Agip and Montecatini as a joint venture. In 1953, it was acquired by ENI.

⁸ "Cathedrals in the desert" is an expression coined by Don Luigi Sturzo to refer to all those public infrastructures (often industrial ones) that have been realized with the idea of becoming the fly-wheel for increasing the local economy, but that at the end are white elephants producing more drawbacks than positive impacts.

said it by slowing down slightly in front of the neoclassical-style cathedral without stopping, without lingering on any corner of the city: we were passing through other more interesting places, so the memory remained faded.

A much clearer and more recent impression dates back to when, a few years ago, I crossed Gela to go to Manfria, a seaside town a few kilometers west of Gela. It was a dark night and only the refinery, visible from afar, pierced the stillness that enveloped it with its ghostly illumination: that image, which evoked Gotham, Tokyo or, worse, Fukushima or the frames of a futuristic dystopian film like *Metropolis*, it was the unnatural reality in which the ancient Greek colony *Gheloï* had transformed itself due to its "establishment". From that short stay I understood that Manfria is full of citizens of Gela - which at first glance seemed paradoxical given the extreme proximity between the two centers - and of second summer homes which, despite being a few minutes away from Gela, are visually separated from the refinery, while they are, on the other hand, too close to the sea to comply with the law. On my return, my friends made me cross the historic center of Gela by car, passing in front of the cathedral, once again without stopping and getting out of the car, and pointed out the timolontee walls, a symbol of illustrious Greek remains to which they contrasted the most recent "settlement necklace" of illegal houses. The refinery always remained in the background of our discussions during my stay: a latent and, at the same time, intrusive presence. But as is well known, even data absences are small-big revealing information, which only direct experience in the field can detect.

My gaze was carried away by events without seeking a deeper reading of what I saw and lived and, in the end, I was left with a fleeting idea of Gela, just as my short stays had been. Moreover, I still did not know that I would re-meet Gela a few years later when I began to question myself on the problematic and interdependent relationship between "the city of stone and the city of human beings" (Attili et al. 2008) and to be interested more and more to the role of organized civil society in the planning and design processes of places, especially those in Sicily, where, as is well known, unsustainable and unfair practices of management of territorial resources resistant to change are widespread.

What really mattered to me was to understand how academic and scientific knowledge (especially the Sicilian one) could contribute with its cognitive work to improve the quality of life of the context in which it operates: Sicily and the South. This was an almost naïve and visceral interest and empirical curiosity (Saija 2016: 17) that has always accompanied me and which I became passionate about "scientifically" with my master degree thesis concerning urban regeneration processes in socially and economically distressed historical neighborhoods of Catania (Privitera 2017; Gravagno and Privitera 2019; Privitera and Gravagno 2020).

On the occasion of my PhD research I began to meet, listen and map the stories of the residents and social actors operating in the neighborhood, many of whom had unsuspected planning abilities. Their autobiographical reconstruction generated new understandings of identities and values e; all themes certainly not new but no less fascinating and above all useful for the territories. Although I was not yet fully aware of it, this attempt to do research "getting your hands dirty" (Saija 2016: 16) formed the basis of previous studies

on "ecology of planning" which is based on an evolutionary vision of the relationship between human being, environment and society for which design is an art of relationships and the designer is immersed in a relational field of mutual modification with other living beings and places (Micarelli and Pizziolo 2003). This means that authentic knowledge can only exist in a process of mutual modification between the actors involved (Gravagno 2008), as "you only really get to know what you try to change" (Saija 2016: 13).

It was in that period that I approached environmental humanities, political ecology and environmental justice studies, which I, for some time, had been questioning, analyzing and, in some cases, experimenting with the role of narration - even autobiographical - as a tool for building another knowledge, aimed at resisting the "injustices" perpetrated in the territories. The first-person collaboration in the environmental humanities lab of KTH in Stockholm⁹ and to Toxic Bios¹⁰ (Armiero et. al. 2019a) introduced me to a research family attentive to how the body and its politicization (Iengo and Armiero 2017) can turn into an arena of conflict (Armiero and Fava 2016: 79). In particular, the Toxic Bios is a "public" project that aims to collect and map toxic autobiographies, that are autobiographical stories of resistance and injustice of people in some way affected by environmental contamination. The toxic autobiographies unveil the power structures embodied in nature (Armiero 2008) and consequently assume a crucial role in the construction of a consciously situated knowledge (Haraway 1991) on socio-economic and eco-systemic transformations. Such transformations include the effect of "trans-corporeal toxicity" on both the human and more-than-human bodies (Alaimo 2010).

I began to broaden the horizons of my interests to realize how the environmental issue itself was an element that generates tensions, social divisions but also the coagulation of civic action all over the world, including in Sicily.

In this regard, what happened in the territories of the Simeto Valley may be considered as a significant Sicilian example. Here the opposition to the construction of a new incinerator was at the basis of a long community-based process of transformation that has been defined as "proactive" and "tenacious" and that has been nurtured through the approach of action-research (Saija 2014; Pappalardo 2021).

At the same time, I explored how the link between ecological distributive conflicts and social, racial and gender inequalities was at the center of an entire interdisciplinary field, which ranges from political ecology to critical environmental justice studies (CEJ) (Pellow 2016, 2018), and of how the depredation and (potential or actual) contamination of one's own living environment was the fulcrum of local, trans-generational, trans-national and global mobilizations for environmental justice (Pellow 2007; Guha 2016 [2000]). Frontline and fenceline communities have been fighting these battles for decades because they have become aware that safeguarding

⁹ My period as a visiting researcher at the KTH Royal Institute of Technology of Stockholm (Sweden) was supported by the C.M. Lerici Foundation scholarship.

¹⁰ <http://www.toxicbios.eu/#/stories>

the environment is a source and a priority condition of material sustenance even before being an ecological, ideological and cultural option (Martínez Alier 2009: 24 [2004]).

If the ecological question and the pauperization of resources are often interconnected with the exploitation of populations with poorer, or better, powerless economic and social capital (Gaventa 1980), then the very concept of Anthropocene needs to be revised and expanded. The critical approaches of the Capitalocene (Moore 2016), of the Wasteocene (Armiero 2021), of the Plantationocene and of the Chthulucene (Haraway 2015) try to re-signify the concept of Anthropocene. In fact, Capitalocene and Wasteocene emphasize the imbalances of power underlying ecological injustice. Plantationocene describes the ongoing socio-ecological consequences of plantation agriculture and the permutations of technocratic agriculture. Chthulucene focuses on the need for a greater eco-justice that affects all living species, not just humans.

My desire to learn more about the environmental conflicts and justice movements in order to both understand how those have been emancipatory factors for the affected and fenceline communities and to make a comparison with the Italian context, has pushed me to spend a period of visiting alongside Prof. David N. Pellow at the Department of Environmental Studies at the University of California Santa Barbara where I am right now¹¹.

The reflective and cognitive expertise, now widely consolidated in the international and national debate of the humanities and social sciences (from environmental history, to anthropology, from political ecology to environmental justice studies), seemed to me that it did not find sufficient consideration in the hard sciences including urban planning, which is simultaneously a technical and social field. This dyscrasia became even more striking when, during my doctoral training, I realized how the hard sciences and the sciences of planning and design - in line with the trend of ecological modernization (Mol and Sonnenfeld 2000) and of technological efficiency - deal with the issue of environmental risk by continuing to place dogmatic trust in numerical data and technical practices. However, as argued in previous publications (Gravagno and Messina 2008: 14; Privitera 2019; Privitera et al. 2021) the limits of these technocratic and merely quantitative approaches appear evident to me as they fail to read the multiple and nuanced transformations in all risk landscapes where contamination occurs slowly over time and is diffused over space, and where environmental issues are thickly interconnected with social and power relations.

I therefore decided to investigate how the profound, qualitative, humanistic (and more than humanistic) and self-reflective way of producing knowledge could dialogue, intertwine, integrate and transform the knowledge that supports planning and design in areas at risk, while making them more ecological and democratic at the same time. I decided to study how the understanding of the multiple perspectives of those who live in a context at environmental risk can reveal the plural and insurgent knowledge of the communities that live in the

¹¹ My period as a visiting graduate student researcher at the University of California - Santa Barbara (UCSB) was supported by the Fulbright Program. More in detail, I won the Fulbright – Falcone Foundation– NIAF scholarship.

territories. In order to do so, in my doctoral research I tried to explore that hybrid space between environment, planning and knowledge that would have allowed me to deepen my knowledge of a territory in which ecological issues are viscerally intertwined with the controversial transformations of the local cultural, social and economic fabric.

A moment that proved particularly useful for a first situated understanding of the complex issues on which I had decided to work was the public presentation in Catania of the book about Gela “La città a sei zampe”¹² (Turco 2018), during which - together with the author - sociologists, anthropologists, historians, economists and trade unionists discussed the gaps and opportunities of the green reconversion of a petrochemical plant in Gela. On the one hand, the trade unionist present at the meeting stated that he could not “bite the hand that feeds you, as the petrochemical body had brought progress to Gela, and if ENI had not been in Gela, “At this hour we were still with the shotgun and the flat cap”; on the other hand, the activist and journalist author of the book tried to denounce years of pollution and political corruption. In short, the collision of divergent visions on the history of the territory was evident and also emerged as the aftermath of industrialist rhetoric, far from being insignificant, were still the subject of contention over concrete imaginaries and policies, past, present and future. It thus became clearer that Gela could actually represent an ideal place to put into practice the type of approach I had in mind, based on a non-detached and neutral “contamination”¹³ between different disciplines and knowledge.

Gela was therefore an extreme case that would have allowed me, among other things, to apply an analytical approach to the field with a multi-scale spatial and temporal focus (Pellow 2018). This focus means to give attention to the smallest data embodied in the collectives of humans and more-than-humans, by framing them with respect to broader systemic and structural issues, from the past to the present to the future. Furthermore, the contaminated landscapes of Gela seemed to me an ideal context both to reflect on forms of violence and disaster stratified in time and space, and to think about the visions of possible futures that emerged from the places of late industrial modernization in Sicily.

With some appointments on the agenda, I then returned to Gela for a series of visits and stays, this time however as a scholar-researcher who intended to reflect, together with the people I had contacted in the meantime, on issues concerning the forms of knowledge and the practices of living in that territory.

¹² The translation of “La città a Sei Zampe” would be “The six-legged city”. This title is not by chance, instead it refers to and re-interprets the logo of ENI representing a six-legged dog. In the '50s Enrico Mattei wanted to use a competition for ideas, open to everyone in Italy, to design a logo for ENI. It was from this public appeal that the six-legged dog was born. The logo was seen (and told!) as a visual synthesis of the strength, energy, and optimism that were driving Italy's economic miracle. While ENI is so proud of this logo and its history to dedicate to it entire web pages of explanation (see for instance: <https://www.eni.com/en-IT/about-us/history-of-logo.html>), the author of the book refers to it with bitter irony in order to emphasize that ENI shaped so much the history of Gela to convert it into a “ENI’s city”.

¹³ See note 1.

From the very beginning, I was struck by the reactions (external and internal) expressed towards the territorial choice I had made. The first, above all, revealed impressions of disbelief, surprise and irony: “With all possible places to work, why Gela?”, “Gela? A horrible place!”, “Be careful!”, “Don't get sick”, “What are you going to do in a remote and chaotic place like that?”. Phrases spoken by people who, at times, had never seen the town, confirming how the imaginaries of Sicilians are often pervaded by stereotypes and prejudices. To the external preconceptions, however, there were others that came from within, especially from some citizens of Gela. In fact, my presence did not go unnoticed, because it evidently touched sensitive and contradictory points of the existential condition of the people I interacted with, arousing curiosity, embarrassment, hostility, and skepticism from time to time. On the one hand, the fact of being Sicilian seemed to open some doors for me and make me gain a certain understanding and trust among the locals; and on the other, being a young researcher (a woman too!) who moved independently in the territory was not always appreciated, probably due to a residual patriarchal vision and a tendency to code relationships based on gender markers. More frequently, I was considered as yet another outsider, intending to use the "Gela case" for some scoop or scientific publication (on malformations or industrial contamination, it didn't matter). The mistrust, albeit hidden, transpired from the proxemics. From my point of view, this mistrust told of a territory that for decades had been prey to different forms of "extractivism", not only economic and material but also scientific and academic (Privitera 2021a). I have often had the impression that in Gela citizens have been considered and/or have ended up considering themselves as 'laboratory guinea pigs', indicators of bio-accumulation of harmful substances to be used for social, economic, epidemiological studies of which they did not always grasp the meaning or the usefulness of everyday problems (first of all connected to employment prospects and health conditions). What has been said pushed me to reconsider the ethical posture in the field and to remark, first of all with myself, how the purpose of collecting autobiographies should be to transform them into collective and shared knowledge, with the explicit desire to contribute to transforming and innovating the social, environmental and productive fabric of the area. The very phase of listening, interaction and engagement could represent that "threshold space" between the territory and the academy to be inhabited in order to implement the “third mission” of the university¹⁴ (Cognetti 2013). In line with the initial empirical curiosity that I had nurtured, my positioning aimed not at a mere observation and flat description of reality, but at a deep understanding of it aimed at action.

Despite all the harsh restrictions due to the covid pandemic, I was able to spend some periods in Gela during these last three years. Gela from being at the periphery of my thought has become a central concern of my

¹⁴ The main missions of university institutions are three. The first mission is “Education”, i.e. the university's responsibility for qualifying the human capital. The second mission is “Research”, i.e. its take of producing new knowledge. Finally, the third mission regards the goal of universities to engage with societal needs and market demands by linking the university's activity with its own socio-economic context. In Italy (but not only) a quite wide debate is drawing attention to the crucial potential of engaged scholarships to fulfill the third mission while intensifying the service-learning toward the most distressed areas.

scientific reflections, bringing me constant doubts but also incredible insights. I had the chance to dwell at the intersection of multifaceted knowledges including that of both the experts and locals. I have done this in the hope that this epistemological, heuristic and social posture of the research experimented in the field will be able to make me move in a holistic and "consilient"¹⁵ framework (Martínez Alier 2009: 58 [2004]). The wish is that this approach may be usable in the planning arena as actionable knowledge, able to generate changes in territories, especially the marginal and powerless ones, of which Sicily still represents a rather striking case, and Gela even more.

Gela has also, and above all, given me the possibility to meet passionate people who struggle daily with the legacy of a contaminated powerless landscape by experimenting with new projects and groundbreaking ideas. Thanks to them I had the opportunity to learn about my homeland through their eyes, lives, and bodily experiences. This work is also a gratitude acknowledgement to all of them.

Isla Vista, CA, November 14, 2021

¹⁵ According to Joan Martínez Alier (2009: 35 [2004]), "consilience" means to consider simultaneously the different types of knowledge appropriate for different levels of analysis. This concept is in line with the "systems research", or the "orchestration of the sciences", which fit well with the ideas of "coevolution" and of "emergent complexity" implying the study of the human dimensions of ecological change and therefore the study of human environmental perceptions. This means introducing self-conscious human agency and reflective human interpretation in ecology.

Introduction

Whether we like it or not, the South¹⁶ with its misery and its prospects, as well as its contradictions and contrasts, will continue to be the testbed for everything that is done and will be done in order to create a more “just” and civil society for everyone

"Industrializzazione senza sviluppo. Gela: una storia meridionale" (tr. Industrialization without development. Gela: a story from the South)

Eyvind Hytten and Marco Marchioni (1970: 9).

These sentences are at the beginning of one of the main books, titled "Industrializzazione senza sviluppo. Gela: una storia meridionale" (Industrialization without development. Gela: a story from the South) that critically questions the shortcomings of the top-down and imposed industrialization process in the poorest and marginalized places. Its authors, Eyvind Hytten and Marco Marchioni¹⁷, expert scholars of the “Southern question”¹⁸, aimed to highlight through the case of Gela and the discrepancy between technological progress and social development. Their research was commissioned in the ‘60s directly by ENI to do an in-depth analysis of the social impact of the industrial modernization carried in Gela and in order to tell, in fact, about it as a story of success. It was not by chance if they were involved precisely to study the case of Gela, instead of other similar situations ongoing in Italy. At that time Gela was at the focus of interest for many political scientists, statesmen, scholars because it was one of the testbeds of top-down national strategies of development that were centered on what has been defined as “poles of industrial development”. The core idea, which I will better explain in chapter 1.4., was that the State should be the one that intervenes directly into all those contexts considered as underdeveloped and poor by importing wellbeing and socio-economic development through the construction of huge state (or semi-state) plants that were dealing with profitable sectors, such as oil and gas extractions and refining. The concentration of intense industrial activities should have stood in as the driving force of multiscale cascade effects that should have reduced, consequently, according to the mainstream narrative, the historic gap between South and North of Italy. The “poles of

¹⁶ The authors refer to the South of Italy. Nevertheless, nowadays it would be consistent to interpret the concept of South expressed in this sentence in a wider sense by including also the South of the world.

¹⁷ Eyvind Hytten was a Norwegian moral philosopher who worked side by side with Danilo Dolci in Partinico (Sicily). Marco Marchioni was a political science scholar who specialized in projects for the development of distressed areas.

¹⁸ The “questione meridionale” (the southern question) is still the biggest unresolved problem in the history of the Italian state. It refers to the socio-economic dualism between South and North of Italy, already existing in 1861 when the Kingdom of Italy was born. Since then, despite the great development of the Italian economy as a whole, and therefore also of the South, the economic and social difference between North and South has progressively increased, with the first more rich, developed and industrialized than the second one.

development” strategy has been widely applied, especially in Sicily where three different areas have been massively affected: Milazzo in the Tirennean side, Priolo-Augusta in the East coast, and finally Gela.

Gela was a quite emblematic town in the South of Sicily, founded by Greek at the time of Magna Grecia, whose ruins still beautifully stood (and still stand) visibly, and having in the 1960s a socio-economic structure mainly based on agriculture, fishing and craftsmanship [Figure 1]. It was suddenly catapulted into the industrialization process in the time frame of ten years as soon as the first oil was discovered in the guts of its gulf.

Enrico De Mattei, who at that time was the chairman of Agip, Azienda Generale Italiana Petrolio - General Italian Oil Company¹⁹, obstinately pushed so that the State would invest in Gela. To have success in Gela, a “backward, unremarkable²⁰, poor Sicilian town”, would have meant to have the chance to have success everywhere else while corroborating the progress optimistic narrative led by the State²¹. Mattei's influence and charisma made possible within a few years the actual realization of additional oil exploration drilling tests, and then, within ten years, the very construction in Gela of one of the biggest European petrochemical plants that were officially inaugurated in 1965. This new modernization project entailed the comings and goings of experts, businessmen, and statesmen, journalists, a very turmoil!

It was in the midst of this ferment that the two sociologists Hytten and Marchioni carried out their immersive research in Gela where they moved for two years. The “small story” of their research work is almost legendary in Gela. There was always a point in which, during my fieldwork, someone was saying to me something like “by the way, you know the story of those two foreigner scholars, right? If not, you should definitely know it”. In short, the legendary story, that yet became part of the collective diffused knowledge, says that, despite the obvious opposition of ENI and the withdrawal of the commission from the two sociologists, the latter decided in any case to put pen to paper and publish the reflections coming from two years of sociological analysis. This is how "Industrialization without development" was born, which is now considered as a cornerstone of the

¹⁹ Agip (Azienda Generale Italiana Petroli, English: General Italian Oil Company) is an Italian automotive gasoline, diesel, LPG, lubricants, fuel oil, and bitumen retailer established in 1926. It has been a subsidiary of the multinational petroleum company Eni since 2003, when Eni acquired Agip Petroli S.p.A., creating the Refining and Marketing Division (R&M). Azienda Nazionale Idrogenazione Combustibili (ANIC) was an Italian chemical company, established during the Fascist regime with the objective of obtaining synthetic gasoline by hydrogenation of brown coal. It was set up in 1936 by state-owned Agip and Montecatini as a joint venture. In 1953, it was acquired by ENI.

²⁰ I am borrowing these words from the language used in both newspapers and documentaries of the period ‘50s-‘70s, how I will better explain in chapter 3.3. and the filmography.

²¹ It is worth pointing out that ENI (originally an acronym for the company's full title Ente Nazionale Idrocarburi - National Hydrocarbons Board), was an Italian oil and gas company, created by the Italian state as a public body in 1953, then converted into a joint stock company by Law Decree in 1992, and listed to the Italian and New York Stock Exchange in 1995. Nowadays it is, in effect, a multinational corporation.

literature on the development of the South. It is said that it remained in Italian bookstores for a few days until legendary ENI emissaries apparently bought all the copies, making them disappear from circulation. It is also said that these books disappeared in Gela even before they could be exhibited in bookstores. It would take twenty years for this text to be re-discovered, read and studied. This little legendary story is told by the local inhabitants as a testimony that further confirms that they live in a treacherous and uncivilized context. After all, the long discussion that still animates the public debate of Gela regarding the choice of re-naming, or not, a local street with the names of the two sociologists, says a lot about the past and still current controversial and clashing perspectives on some burning topics²².

The two scholars, rather than encountering the so-called multiplier effects that the enormous investments made in Gela should have aroused, already at the time of their research, in the late 1960s, encountered the drama of a total discrepancy between the narrated and official image and the harsh reality. They had a hard time grabbing the real essence of the ongoing process of development by actually finding it blurred by contradictory interpretations, that, in line with some contemporary scholars, I would rather prefer to call “narratives”. These mainstream tales have edulcorated what was actually occurring in Gela with the rhetoric of the massive industrialization as the only possible path to achieve social and economic progress. Their argument was that Gela is not such a “specific” case, nor that the problem of the South can be tackled as a separate issue; instead, they state that all the features of development encountered in various places in the South are “manifestations of a social pathology that affects the whole of society, even in its more advanced areas and sectors” (Hyttén and Marchioni 1970: 8). This is because “the development based on the accumulation rather than on the distribution of goods, on the concentration of power and opportunities, on the further marginalization of the community rather than on its greater participation in public life, is a problem that affects both affluent society and developing communities of transformation” (ibidem). In other words, Gela was a privileged angle to scrutinize and unearth the contradictions of industrialization progress rhetoric and to get through to how the marriage between technocratic capitalism and Bourbon attitudes²³, between corporate paternalism and mafia

²² Despite being Eyvind Hyttén and Marco Marchioni pretty well-known researchers, they are still two thorny figures in the collective narrative by the residents of Gela. The current local debate on dedicating to them or not a street of Gela is an emblematic example of how the relationship with the critical work by the two scholars is still a controversial one. Coming from the proposal from a city council member, such an idea instead of being immediately accepted in unison by the city council, has triggered a vivid and not yet finished discussion on the convenience, or not, of renaming a street on their honor.

²³ The Spanish Bourbons ruled the so-called “Kingdom of the Two Sicilies” in Southern Italy and Sicily for more than a century until the unification of Italy in 1861. In the meanwhile, between the 18th and 19th centuries, the North part of Italy was the theater of the rise of the first republican and democratic movements. Because of this, there is a common feeling, as well as copious literature, on the presence of a legacy, in the South of Italy and in Sicily, of “bourbons attitudes” that makes the residents feel as still subjects of a monarch system, instead of free critical citizens of a modern democracy.

behavior nullifies any possibility of a real break with the archaic socio-cultural structures, which, on the contrary, are amplified and flanked by further exclusionary dynamics of marginalization.

While the town of Gela was experiencing an intoxicating sensation of well-being, Hytten and Marchioni denounced that the industrial revolution would not have miracled anyone, rather that Gela would have experienced disappointments and disasters due to the marginalization of the community from the transformation processes. They ended the book with the following open questions (Hytten and Marchioni 1970: 131): "Could it have gone differently, could a community with a strong agricultural economy have reacted conveniently? Were there the conditions for Gela to become aware of what was happening? How would the community of Gela have equipped itself with the tools, means, resources to keep up with that "present" that had suddenly arrived?". They say no. Industrialization can also lead to social development when it becomes an element of authentic break with the unjust dynamics of power and social injustice. When industry, on the other hand, comes to terms with such pre-existing forces, then the process of marginalization, rather than shrinking, increases. Nevertheless, the authors depict a contradictory reality but leaves room for some optimistic hopes. The authentic and deep social renewal needs the community of Gela. Although it has been 51 years since the publication and many things have changed, their words still sound up-to-date.

The following dissertation thesis starts exactly from their final assumptions and from the idea that planners should question their mainstream approaches and rethink how to be present in those places where it seems even more difficult to carry on any initiatives, where people seem more powerless, less involved, the public institution unable to fulfill their role, and the landscapes more degraded. Gela seems to be such a kind of place.

Over the last decades one side of the dream of the progress has gradually vanished due to the crisis of oil production and the change of ENI from a national corporation -that at least officially tries to achieve, through the industrial production, the "common good"-, to a multinational oil and gas company yet became of the seven "supermajor" oil companies in the world, whose final goal is not for sure the common good, instead the maximization of the private profit. Gela, at the beginning at the center of national State strategic development strategies, has turned to be more and more peripheral in the international business arena of ENI that, at this stage, has already expanded its business in all continents. Therefore, Gela is a quite exemplifying case of the end of the illusion for those who believed in the role of renewal of the state industry in an anti-capitalist and anti-colonial function. Since the 70's instead of increasing the production and places of work, ENI has initiated an inescapable downfall of its investments in Gela and has started to shut down some productive sectors. Furthermore, its presence has stimulated the birth of several companies as a direct consequence; however, they mainly rely on ENI orders, having been actually unable to create a further and independent job market beyond the one by ENI. If on the side of the socio-economic developments the myth of progress was a failure, also the social effects have been disappointing. The presence of this huge plant near a relatively small town has increased the inner socio-economic divides of the community, instead of intensifying social cohesion and feeling of belonging. Especially, new frictions and dissatisfactions arose between those who were somehow

involved in the new industrial modern revolution and felt herald of civilization and progress, and those who kept their traditional jobs who felt the injustice of being paid less and treated as a primitive. In addition to the process of social marginalization already identified since the most embryonic stage also by the two sociologists, it must be considered the laceration of the harmonious relationships between human and more-than-human-beings-society-and the environment that has permeated and still permeates the history of the landscapes of Gela and that has been much less explored. As a matter of fact, the presence of the plant since the 1960s has meant the daily presence of environmental pressure for almost seventy years causing unexpected and dramatic impacts on the population health (both human and more-than-human) and in the relationships between them and their daily environment of life.

Considering that, the rules about environmental risk have started to shyly appear since the 1980s, becoming stricter and in line with the European directives only since the 1990s, it can be understood why the landscapes of Gela have gradually absorbed toxicity over many decades without someone who has even been questioning if this was unjust or not. However, the effects became undeniable and Gela was declared "at high risk of environmental crisis" in 1990 (Resolution of the Council of Ministers 30.11.1990); ten years later, the Ministry of the Environment (Decree 10.01.2000) identified a portion of the municipality of Gela, including the adjacent sea, for a total of 51 square kilometers, as one of the Italian RSINs—Remediation Sites of National Interest, i.e. highly contaminated areas classified as dangerous by the Italian State and in need of remediation. Then, the National Research Council and the Ministry of Health conducted three epidemiological studies that confirm excessive amounts of toxic substances in the resident's bodies. Nonetheless, the causal nexus between environmental exposure and illness remains problematic to prove because it is never easy to firmly identify the environmental causes of the increase of cancer, congenital anomalies, and other diseases (Bianchi et al. 2006a, 2014; Pirastu et al. 2010, 2011; Santoro et al. 2017; Zona et al. 2019). After a gradual decrease of the production activity and sanctions for the produced pollution, in 2014 a Memorandum of Understanding for the territory of Gela (Ministero dello Sviluppo Economico et al. 2014) established the conversion of the refinery toward a bio-refinery together with new eco-friendly investments: a green showcase that, according to some critiques (Peca and Turco 2020) hides a greenwashing strategy.

A missing piece apparently seems to be the role of citizens of Gela in all this long story. What have they done? Have they reacted? If yes, how were these reactions effective? Actually, the community of Gela is often depicted as fragile, fragmented, and marginalized. Or better, as "a reality that does not resist" (Saitta 2009: 162), marked by the fragility of the social fabric, by the weakness of associations, by widespread individualistic and familistic behaviors, and by the "extraordinary immobility of social, economic and political forms" (Pellizzoni 2009: 185). Being the theater of a bloody mafia fight for more than two decades, Gela has been seen as a place where public participation is interpreted just in personalistic terms, in which forms of political management of the territory are based on decisions taken from above, rather than on the activation of popular mobilization processes (Becucci 2004). The "lack of collective social capital and mutual and community trust" (Becucci 2004: 9) and the combination between social and psychological degradation with the environmental

one (Saitta 2009), convey a picture of a local community without neither the capability to self-organize and rebel, nor the ability to imagine alternative futures. Suffocated by the legacy of its own history, Gela seems a “town without future”²⁴. Furthermore, this imaginary of Gela of a distressed and backward place, populated by ignorant and poor people, has been even more emphasized by a certain type of mainstream and official tale, defined in literature also toxic and in(justice) narrative (Wu Ming 2011) that occupies the public discourses by acclaiming the blind faith in the industrial progress as the unique redemption path, while diminishing any alternative voices, invisibilizing and/or silencing them.

In reality, the bounds among people and their daily life environment have been transformed slowly over time and space and contaminated by both concrete toxic matters and toxic narrative. In this sense, the landscapes of Gela enclose several features that can be found in literature and in some theorization. For instance, the landscapes of Gela can be considered the effects of “slow disasters”, a concept that was envisioned by Scott Gabriel Knowles (2020: 192) to give prominence to how “disasters aren’t events that float freely in history, unmoored from politics: they are processes, playing out in uneven temporalities, and always with deep histories”. More in detail, “the slow disaster is the timescale at which technological systems decay and post-traumatic stress grinds its victims; this is the scale at which deferred maintenance of infrastructure takes its steady toll, often in ways hard to sense or monetize until a disaster occurs in “event time” (Knowles 2020: 197). Therefore, slow disaster can be defined as “a way to think about disasters not as discrete events but as long-term processes linked across time. The slow disaster stretches both back in time and forward across generations to indeterminate points, punctuated by moments” (ibidem). Another concept that may be useful to frame the “wasted relationships” (Armiero 2021)²⁵ between the local community and their daily environment of life in Gela is the “everyday disasters”. The landscapes of Gela can be seen as the stratification of bivalent behavior of people toward the effects of contamination. As a matter of fact, the creeping and slow toxicity implies a process of “normalization of threat” due to which the chronic and “everyday disasters” are more likely “to remain suspended in uncertainty [...] surrounding not only their underlying causes but also their long-term, not clearly evenementiel effects. Indeed, constant exposure to adversity makes it harder for people to recognize the state of vulnerability their local communities are exposed to, driving them to resort to categories of invisible forces, neglect, and denial to define their daily experiences of the disaster (Benadusi 2018: 47). Finally, the landscapes of Gela have been affected and shaped by slow violence that “occurs gradually and out of sight, a violence of delayed destruction that is dispersed across time and space, an

²⁴ This sentence has recently been echoed due to some statements made by the local artist Giovanni Iudice who, in open criticism with the way the local administration deals with the historic cultural heritage, declared that the only solution for Gela is the past because it seems that there is no future for the town. This is in line with a pessimistic and quite spread narrative regarding Gela and with the idea that only cultural tourism connected with the Greek roots can revamp this area.

²⁵ According to Marco Armiero (2021: 3) “wasteocene logic reproduces wasted people and ecosystems”, where waste can be conceived as a (wasting) relation that produces the targeted community rather than solely selecting it as the ideal place for an unwanted facility.

attritional violence that is typically not viewed as violence at all” (Nixon 2011: 2). The concept of risk landscapes so-far applied in literature does not take into consideration all these “slower-burning issues” (Mah 2017: 130), while it has mainly referred to the unfair distribution of goods and burdens (Morello-Frosch et al. 2001; Morello-Frosch and Lopez 2006) and to the mapping of how the material dimension of potential physical threats interplays with the discursive dimension of how people perceive it (Müller-Mahn et al. 2018; Davies et al. 2020).

In the light of what so-far written, it is now more clear that the community of Gela has to face several challenges: to disentangle a narrative of injustice dismissing their stories (Houston 2013; Barca 2014); to provide a direct causal nexus between exposure to pollutants and health issues; to struggle in order to have guaranteed basic needs such as clean air and water; and to confront with certain types of science considering them as the mere test subject of bio-accumulation.

It is exactly for all these reasons that the case of Gela provides a privileged perspective for reflecting on how the process of planning itself may be a way to achieve more socio-ecological justice landscapes. In fact, the “risk landscapes” of Gela, having been contaminated slowly over time, in a diffused way over the space, and compromised from a socio-economic point of view, are an optimal case to reflect on how planning itself may be an emancipatory tool in risk landscapes. And, more in detail, on which tools of knowledge can be used in order to apply fairer planning in marginalized communities struggling with socio-economic and environmental issues.

The mainstream approach to planning of risk landscapes does not capture the multiple ways through which the communities face those challenges. Such a lack is even more evident if one decides to trespass the borders between the disciplines in order to understand how other fields of knowledge have dealt with risk knowledge. I will especially do it by looking at how the environmental justice studies (EJ), the environmental humanities (EH), and the political ecology (PE) have tackled and discussed the construction of risk knowledge. With the awareness that all those disciplines have different historical and cultural backgrounds and that just to adapt them to the Italian context would be a mistake, I do believe that they may provide many insights for all those engaged researchers and planners who are interested in authentically interrogate both theoretically and practically how improve the way in which planning confronts the risk spread in contaminated and powerless landscapes. Such an attitude implies an intentional will to be both disciplinary and methodologically “undisciplined” (Armiero et al. 2019b) and intentioned to impact the field of study.

I will show how a planning approach focusing almost exclusively on a quantitative and technocratic analysis of risk can uncover neither the socio-economic and environmental transformations of risk landscapes, nor the community’s responses to risk. I will prove that this inadequacy is even more apparent in all those cases in which “slow” (Knowles 2020) and “everydays disasters” (Benadusi 2018) occur, such as in all those places in which harms are products of long and gradual processes of environmental degradation and entwined failures of nested sociocultural, political, and technological issues (Gray-Cosgrove et al. 2015; Knowles 2014, 2018).

These "slower-burning issues" are more difficult to measure with conventional methods of science or big data (Mah 2017: 130) since they are environmental hazards occurring on slower time scales. The mainstream planning is not even able to intercept all those forms of slow violence (Nixon 2011) shaping the risk landscapes, including the ones of Gela. Moreover, I find this gap regarding riskscapes while I was doing my literature review and through this dissertation I aim, among other objectives, to re-signify and extend the concept of riskscapes to all these slower-burning issues that are due to the dynamics of everyday disasters and because slow violence produces slow disasters diffused into spaces over time.

Building upon Alice Mah's proposal "to slow our approach to the big data" (Mah 2017: 130), I approached the field as a place created by the actors through their relationships, and in particular through actions aimed at affirming and countering the positions of domination and subordination, of the vanguard and rearguard, inscribed in local history. This attitude has entailed at least two important consequences on the research. The first was to place myself in a condition that I have defined as "small-slow-street -SSS" (Privitera 2021b; Privitera et al. 2021). The notion refers to two epistemological channels: one relating to "situated knowledge" - for which "only partial perspective promises objective vision" (Haraway 1991: 190) since "the only way to find a larger vision is to be somewhere in particular" (ibidem: 196) and objectivity, among other things, is also a "situated rationality" (ibidem); the other referable to the so-called slow science, for which science must involve itself, with openness and honesty, with an audience of intelligent interlocutors from whom to learn in a condition of informality, in a "street" dynamic (Corburn 2005), and with which to have bonds of interdependence and mutual learning (Stengers 2018).

The second consequence of my way of understanding the field was to interpret the history of the petrochemical plant in its relationship with the oppositional and proactive forms that arose in the territory, and therefore to pay attention to resistance and planning practices aimed at rebalancing the differentials of power on the pitch. This heuristic-social position of the research allowed me, among other things, to come into contact with figures who had a history of resistance behind them (Saitta and Pellizzoni 2009) and with bearers of alternative proposals who, aware of the problems of Gela, they are experimenting with different ways of improving their living conditions and reconstituting a social fabric that was more consistent with what they consider a "healthy" socio-economic development. As I will present in the next paragraphs (chapter 2 and 3), these are alternative sources of knowledge, often of a militant type²⁶, also manifested through a "gray" literature, published by minor publishers or self-financed; knowledge that allows to recognize and explore different modulations of civic and political commitment in the territory.

A small slow street approach represents a turning point both epistemologically and methodologically. I argue that by applying SSS it may be possible to intercept a series of "small data". Together with Marco Armiero and Filippo Gravagno (Privitera et al. 2021: 848) we have defined small data as "qualitative data exposing the

²⁶ I am borrowing the word "militant" from the wider meaning given to "militant science" in Barca (2012).

complex entanglement of human-non-human relationships and how they shape landscapes through time”. Although small data are embedded in the stories of both human and more-than-human communities, I will give special attention to all small data coming from the collection of “toxic autobiographies”, which are stories produced by people who have encountered contamination during their lives (Armiero et al. 2019a). These autobiographies regard the everyday relationship between human and non-human bodies with contamination (stench, pollution, waste, diffuse illnesses, and devastated landscapes) and seek to co-produce a counter-hegemonic narrative and enhancing narrative of justice.

The SSS also aims to create a relational field in which to valorize all those forms of insurgent knowledge and practices that may be a harbinger of future engaged research and partnership with local actors. While the insurgent practices have been the focus of Leonie Sandercock (1999, 2003a) and other scholars who refer with this term to all those actions or stories somehow oppositional and instigated by mobilized communities, the insurgent knowledges, that are incorporated in the stories, bodies, and experience of human and more-than-human communities is something that has been much less explored and that this dissertation seeks to address.

Employing Gela as my case study, I aspire to operationalize the SSS as a fairer and better methodology for capturing citizens' perceptions and experience of industrial risk and their resistant and resilient actions to tackle it. I aim at exploring the hybrid common ground where subaltern communities and engaged researchers contribute to the planning of contaminated areas. In the process, I unearth the limitations of the current mainstream planning approach and Italian law on industrial landscapes.

It is worth recognizing that this research is the fruit of three years of an intense adventure through fields (disciplines) and forms (expert-lay) of knowledges²⁷, territories and countries. It is the result of the joint effort by the LabPEAT-Laboratory of Ecological Design at the University of Catania and the Environmental Humanities Lab at the KTH Royal Institute Technology of Stockholm to trespass the borders of their own “disciplinary backyard” in order to navigate and dwell the unknown borders of knowledge. In order to do this, I spent an entire semester at the already mentioned Environmental Humanities Lab as a C.M. Lericci Foundation visiting fellow under the supervision of Prof. Marco Armiero, co-supervisor of my Ph.D. as well, and at the Department of Environmental Studies at the University of California Santa Barbara as a Fulbright visiting student researcher under the guide of Prof. David N. Pellow. Thanks to these periods of learning and exchange, I constructed my trans-disciplinary approach to the issues. My supervisors Prof. Filippo Gravagno and co-supervisor Prof. Giusy Pappalardo have always supported me in trespassing, getting lost, being disciplinary disobedient but remembering to come back into the planning, hopefully, bringing with me an innovative and useful contribution. It can be understood why this path of research has been everything but linear, instead it has been continuously nurtured by input from the fieldworks, from other fields of knowledges, and characterized

²⁷ In the same manner as Leonie Sandercock's work, I will use the word “knowledge” also in the plural form “knowledges”, despite the proper English grammar would consider it as an uncountable noun. I will do it in order to emphasize the presence of varied forms of knowledge, and not only one.

by several changes of directions: a condition further accentuated by the COVID-19 global pandemic. However, for the sake of simplicity of explanation, I have organized the entire dissertation in five main sections.

The preface seeks to introduce the reader to the case by outlining the personal and academic backstage of it. The entire dissertation started with two personal statements. I do it intentionally because I espouse the feminist epistemologies arguing that "the personal is political" (Hanisch 1970), "the personal is scientific" (McCormick et al. 2003) ergo (my emphasis), "the personal is scientific" (ibidem). The results, for sure perfectible, of this work are the fruit of my positionality and my attempt to give birth to knowledges that are both scientific, partial, and "situated". Understanding from where this research comes hence helps to comprehend its process, development, and outcomes. The first personal account regards my personal and professional backstage behind my arrival in the PhD adventure and the choice of Gela as a case-study. This is viscerally connected with my Sicilian roots, but also with my background as a young scholar specialized in urban issues, having on one side training of hard-scientist as an engineer, on another side, previous and current in first-person experiences as an activist passionate about community engagement.

The second statement regards, again, a personal and professional path but that drove me to embrace the plea for slowing down in a holistic sense, both in epistemological, methodological, political, and personal terms, i.e. in the way knowledge is produced and impacts the real contexts.

After the aforementioned preface and introduction, the dissertation is organized as it follows.

The first section regards the theoretical framework on which the entire dissertation is hinged. It serves as the foundation -made of literature-review, previous reflective, disciplinary, and methodological tools- on which to build the SSS proposal. This section is a critical journey during which I will be undisciplined by crossing disciplines and regulations and by looking at how they deal with the construction of knowledge in risk landscapes. It is further organized into five sub-parts. Chapter 1.1. concerns about how from the theories of risk can be extracted insights on the tension between the different manners of constructing risk knowledge, especially on the relation between expert and lay one. In this subsection, I will also review what has been so far in terms of the attempts of spatializing the construction of risk knowledge through the concept of "risk landscape". Chapter 1.2. will go into the planning field. I will cruise among the different schools of planning and currents of thoughts that over time, from the modernist and rationalism standpoints until the most recent radical approaches, have addressed in different ways the building of risk knowledge, especially the environmental one, interconnecting it (and often not doing this) with the socio-economic urban injustices. This part of the text is undoubtedly the legacy of years of collaboration with the LabPEAT-Ecological Lab inspired to the paradigm of action-research at the University of Catania of which I have been part since 2016, I was lucky enough to collaborate with Prof. Filippo Gravagno and Prof. Giusy Pappalardo. Chapter 1.3. I will go through and compare how the main regulations at different governance levels treat the risk knowledge. Chapter 1.4. goes through three fields of knowledge that have widely dealt with risk, which are environmental justice studies, environmental humanities, and political ecology. This subchapter is actually the reflexive result of my

period at Environmental Humanities Lab of the KTH of Stockholm (Sweden) and at the Department of Environmental Studies at the University of California Santa Barbara (California). Finally, this theoretical framework and quite extended literature review will allow me, in chapter 1.5., to bring light to both the gaps and the potentialities emerging from this first phase of the journey through disciplines.

All these lacks and potentialities make up the starting point from which to outline an alternative and complementary way to research in risk landscapes, that is the small slow street approach (SSS). SSS is a radical turning point both epistemologically and methodologically, as I explain in chapter 2. In chapter 3.2. I will explain what was the methodology applied in Gela.

Intrinsically practical and theoretical at the same time, the SSS will be proved in the concrete case of Gela, a Sicilian petrochemical town. The results of its practical application in Gela will be unfolded throughout chapter 3. At this point, it is worth specifying that the SSS, while envisioned by referring to previous strands of thoughts and of literature review, is grounded into the input, mismatches, and advice coming from the fieldwork in Gela. It is actually the (ongoing) result of a continuous cycle of reflections and experiences that nurture each other. This chapter is, in turn, structured in several subchapters. I have tried to systematize the huge amount of small and big data by also trying to emphasize how they provide different types of knowledge on the risk landscapes of Gela.

More in detail, Chapter 3.1 retraces back the history of Gela from a mainstream and toxic narrative that has constantly diminished any alternative voice while it was emphasizing almost a blind trust in extractivist and industry-centric economy. I will rely on diverse sources, especially visual, cinematographic, and gray literature that would be almost impossible to find without both an intense archive investigation and intense fieldwork. Chapter 3.2 is the account of Gela from the perspective of all those urban planning policies and tools that have been applied over time, often without being really able to catch the ongoing forms of insurgent knowledge and practices. Chapter 3.3 is the tale of Gela from the quantitative and expert risk knowledge perspective. Finally, chapter 3.4 will tell another story of Gela through the lens of the small data (including the toxic autobiographies).

The fourth section of the dissertation aims to discuss the result of SSS in Gela. I will explain how small data may provide four lenses that allow seeing the slow and diffused change brought by industrial risk: memories of injustice, memories of smell, trans-corporeal stories, and relational stories. Small data enclose spatial value too, since they can geo-reference small anomalies and characteristic of the transformations of risk landscapes that big data are not able to intercept. I will moreover demonstrate how SSS may be appropriate to retrace back an alternative but also community-empowering collective stories of risk landscapes. Finally, I will argue how small data are able to show in relation with space both insurgent knowledges and practices that are potential signal of future imaginaries

The fifth and last section provides some final remarks as well as indicate further possible developments of this research work.

1. THEORETICAL FRAMEWORK

1.1. From Risk Knowledge and Society to (Just) Riskscapes

In this chapter, first I will present an overview of the main strands of thought and debates developed over the last decades on the topic of risk in order to trace a theoretical framework. In particular, I will compare three different approaches: the treadmill of production, the ecological modernization, and the risk society, giving emphasis on how these models have dealt with the topic of risk knowledge, its construction, and its underlying power relations. Then, I will explain why a spatial (and territorial) turn of risk topic through the concept of riskscape can provide useful insights for collecting, building, and interpreting the risk knowledge and for acting in risk landscapes. Finally, I will expound on why the enlargement of the meaning of riskscape toward the slow everyday disasters is able to provide a broader understanding of those forms of risks that are more gradual latent.

An overview of the risk theories

Our earth is at risk, this is all but new to us. More specifically, while all societies have the notion of danger and have historically developed “rituals” for their psychological and social management, the notion of risk is characteristic of modern society. Defined as the probabilities of physical harm due to given technological or other processes, risks give pole position to technical experts to define agendas and impose bounding premises a priori on risk discourse. Risk analysis and management are related to science and technology i.e., to the development of expert systems of technical realization and professional expertise that organize wide areas in our social and material daily environment (Giddens 1990). The risk for human health and for the ecosystem coming from the use of new technologies, from the deterioration of the environment, from the intensification of natural disasters, and from the exacerbation of social disparities, lay at the basis of a vivid debate that has become a battleground fraught with many conflicting perspectives over the last decades. Notable among these are neo-liberal economics inspired by the Promethean philosophy, environmental economics, ecological modernization, sustainable development, ecological economics, the risk society thesis, the treadmill of production, green environmentalism, and “double-risk” societies (Hasan 2018). All of these can be fitted within a continuum spanning from a purely “limits to growth” ideology to a “growth unlimited” school of thought (Dryzek 2013), touching on the “theory of degrowth” (D’Alisa et al. 2015; Liegey and Nelson 2020). Interestingly, adherents to each perspective use very different arguments to support their main claims, meaning that there is no one objective reality in environmental politics (Hasan 2018).

The changing approach to the risk topic over time can be faced through the historical lens. For instance, some scholars have retraced the relationship between risk and health issues (Luzzi 2009). Some other scholars recognize four main phases of recent history about the relationship between environmental risk and society (De Marchi et al. 2001). The first phase between the 50s-60s was characterized by the masterpiece “Silent Spring” by Rachel Carson (1962) and disastrous events such as Bikini (1954), Windscale (1957), and Torrey Canyon (1967), having the merit of sensitizing public opinion above all in the industrial countries; at that time,

also several local grassroots movements arose. A second phase coincides with the decade of the 70s dominated by the publication of “the limits to growth” by “The Club of Rome”, a think tank made up of experts and industrialists under the supervision of Donella Meadows of the Massachusetts Institute of Technology. By using computer simulation, the report concludes that, without substantial changes in resource consumption, “the most probable result will be a rather sudden and uncontrollable decline in both population and industrial capacity” (Meadows et al. 1972: 23). This latter strand reflecting on the limits has also been defined as “neo-Malthusian”.

The third phase is well represented by the so-called ecological modernization. From the ‘90s a fourth and last phase is the one characterized by “risk society”.

Another perspective that has been embraced is much more economic-driven, such as environmental economics and the treadmill of production. Environmental economics undertakes theoretical or empirical studies of the economic effects of national or local environmental policies around the world. Particular issues include the costs and benefits of alternative environmental policies to deal with air pollution, water quality, toxic substances, solid waste, and global warming. An important field of research of environmental economics has been and is the accounting and metering of the environmental cost through often complex cost-benefit and multi-criteria analysis. In order to quantify and reduce the negative environmental externalities, this field of study has pushed for normative updates and financial tools e.g., the formulation and enforcement of environmental standards to which the companies must adapt, as well as financial incentives or disincentives (so-called carrots-and-sticks strategy). Scholars coming from an economic background, such as Joan Martínez Alier, have clarified the reason why environmental economics is distinguished from another strand of economics, ecological economics. The ecological economists do not take into consideration nature in “chrematistic”²⁸ terms, rather through physical and social indicators (Martínez Alier 2009 [2004]: 45-46). By conceiving the economy as a subsystem of the ecosystem, its focus is primarily upon preserving first of all natural capital. The ecological economy stands for a renovation in the way to think about the economy and the science by giving attention to the interdependence between natural phenomena and social dimension and by embracing “interdisciplinary and biophysical perspectives” (De Marchi et. 2001: 104). For this reason, the ecological economy allows studying several processes of decision-making in the context of distributional conflicts. In short, while environmental economics underpin the sustainable development discourse, the ecological discourse is much more connected with the environmentalism of poor and distributional conflicts (Martínez Alier 2009 [2004]). I will discuss this in Chapter 1.4.

Another school of thought and research questioning the cause and reasons behind the degradation of our environment and the increase of multidimensional risks is the treadmill of production framework that formed

²⁸ According to Joan Martínez Alier (2009 [2004]: 44) there is a twofold way to approach economic issues. The first way comes from the Greek concept “oikonomia” which is the art of getting oneself goods and taking care of the home. The second approach is the “chrematistic” one that regards the development of market price in order to obtain more profit.

one of the first contemporary sociological approaches aimed at understanding the social causes and consequences of environmental problems. Introduced between the 70s and the 80s by Allan Schnaiberg, it represents the first and most widely discussed social origins of environmental degradation and inequality as a function of capitalism (Schnaiberg 1980; Gould et al. 2008). According to the “treadmill of production” model, the capitalist economy continues to create ecological problems through a self-reinforcing mechanism of ever more production and consumption. The treadmill of production identifies an “economic growth coalition” including business, labor, and the government, all of whom benefit from economic expansion. The logic of the treadmill of production is an ever-growing need for capital investment to generate goods for sale in the marketplace. From an ecological perspective, this process requires continuous and growing inputs of energy and material. The expansion of the economy drives two fundamental dynamics of a market economy: first, the creation of economic wealth, and second, the creation of the negative byproducts of the production process. The consequent growing level of capital available for investments and its changing investment allocation together produced a substantial increase in demand for natural resources, and then probably more extractive activities. Essentially, the major change outlined in the theory was that more capital was accumulating in Western economies and it was being applied to replacing production labor with new technologies to increase profits. These new technologies required far more energy and/or chemicals to replace earlier, more labor-intensive processes, thus producing deeper levels of ecological disorganization than ever before. The treadmill component recognized that the nature of capital investment led to greater demand for natural resources, for a given level of social welfare (including wages and social expenditures). Each round of investment weakened the employment situation for production workers and worsened environmental conditions, but it increased profits. For production workers, this treadmill implied that increasing investment was needed to employ each one. For ecosystems, each level of resource extraction became commodified into new profits and new investments, which led to still more rapid increases in demand for ecosystem elements (Schnaiberg 1980; Gould et al. 2008). Economic growth was viewed as the primary solution to the negative social impacts of economic growth. Thus, each round of socially dislocating growth generated increased, rather than decreased, social support for allocating investment to accelerating the treadmill of production. Politicians were induced to provide direct and indirect support for such expansion: they received strong support for doing this from investor-managerial groups. And they received public support from workers and their unions, who supported virtually any and all kinds of “economic development” (Gould et al. 2008).

Some publications have applied the treadmill of production as a lens through which to unearth how the social and economic benefits of the treadmill are unevenly distributed in favor of business and affluent communities, whereas the environmental risks associated with the treadmill are disproportionately concentrated among specific groups of people with the least ability to resist the location of polluting facilities in their community. Thus, polluting facilities are sited among “the most vulnerable groups: the poor, unskilled laborers, and the skilled blue-collar” residents (Gould et al. 2008: 13). I will unfold this further in Chapter 1.4.

By tracing how this distribution of power and impotence affected both the ecological systems in which communities were embedded and the economic, social, and biological conditions of workers, “treadmill theory presented an image of a society running in place, not moving forward” (Gould et al. 2008: 12).

Contradictory vision has been confronted over time regarding this model. For instance, according to Gould et al. (2008), the treadmill theory is insufficient to explain all patterns of economic and environmental change since 1980, while some other scholars (Pellow 2006) maintain that the evidence indicates stronger support for the treadmill model compared to other social theories such as the ecological modernization framework (Mol 1996).

Interestingly, the first author of the treadmill of production framework has also been critically approached by the "impact analysis" role of scientists and technologists in the social movement for environmental protection by pointing out how the structural positions of scientific and technological institutions relative to monopoly capital interests are serious constraints on extensions of these roles and obstacles to future environmental reforms. In this view, science and technology as social institutions, engaged in social, political, and economic relationships to the controllers of the major means of production, and technology is the application of knowledge in the processes of social production (Schnaiberg 1976).

However, while the treadmill of production seems to be a theoretical model appropriate for reading the socio-economic dynamics and effects underpinning and generated by the cycles of the capitalist machine, I glimpse a weaker piece with regards to the tricky relationship between the construction of risk knowledge and democratic issues. Concerning this topic, in my perspective, the two sociological theories that have dominated environmental debate so far -the already mentioned ecological modernization, and the risk society- have tackled-head this relationship, even if in two very different ways. I will present briefly both theories and explain why they are consistent with the interest of this thesis.

The ecological modernization theory refers to a group of optimistic theories based on the idea that economic growth can continue while ensuring environmental protection via long-term changes in the structure of production and consumption. These changes must emphasize the need for society, market actors, and the state to proactively manage the environment. First introduced in the early 1980s in a study for the “Berlin Science Centre” and then adopted by the small community of Berlin social scientists that is sometimes referred to as the “Berlin School” of environmental policy research (Jänicke 2008), in the aftermath, the concept of ecological modernization came to exert a strong influence on the environmental debate in Germany and soon gained popularity in other Western European countries. Based on evidence gathered from some affluent European countries, the ecological modernization proponents argued that economic growth can be decoupled from raw material throughput, energy use, and waste generation through the application of environmentally benign technology and the redesign of institutions.

Needless to say, such promising ideas are immensely influential in present-day discourses of sustainable development.

For example, the UN Commission on Sustainable Development, the Brundtland Report, and various environmental action programs in Europe - with their environmentally sustainable development rhetoric, which is designed to reorient fiscal and economic instruments towards technologies for resource efficiency, the internalization of costs, waste minimization strategies, longer product life cycles, etc. - are resonant of EM principles (Selim 2011). The development bias is built into the technocratic interpretation of sustainable development that came to dominate environmental policymaking. A revision of sustainable development as ecological modernization stresses the role of markets, technological innovation, and government-business partnership largely at the expense of socio-ecological change. As a theory of industrial change, ecological modernization suggests that we have entered a new industrial revolution, one of radical restructuring of basic production processes along ecological lines. As a political program, ecological modernization advocates resolve environmental problems through 'harmonizing ecology and economy' (Simonis 1989), and/or through "super industrialisation rather than deindustrialization" (Spaargaren and Mol 1992).

But, as a matter of fact, the effort to build a bridge between environmentalists and industrialists is clearly to the advantage of industrial interests.

Three main characteristics of ecological modernization are the following. First, it reconstructs the view of science and technology as both cause of and the solution for environmental problems. The key focus is placed on encouraging such technological innovation that will make the industry sustainable by both preventing and remedying environmental damage. Innovative technologies are intended to be incorporated at the source of production rather than to be used as an end-of-pipe solution (Mol and Sonnenfeld 2000). Second, ecological modernization regards the market economy as the most effective way to secure the flexibility, innovation, and responsiveness needed to promote the ecological adaptation of the industry (Blowers 1997). Third and lastly, ecological modernization asks for the transformation of the traditional role played by the state in bringing environmental reform. Thus, the State should move away from its traditional command-and-control (top-down) approach toward a more decentralized, flexible, and consensual style of governance. In addition, the State should provide more opportunities for non-State actors – such as the general public, and advocacy and non-governmental organizations (NGOs) – to express their concern on critical environmental issues (Mol and Sonnenfeld 2000).

Rejecting the earlier limits-to-growth argument, the emphasis on technological innovation is seen to be the specific preconditions for environmental revitalization. In this view, only growth driven by technological change can provide the kinds of resources needed to tackle the challenge ahead.

Toward this end, ecological modernization translates the otherwise radical climate-oriented call for social change into business-friendly reform-oriented tasks, emphasizing the use of markets, cost-benefit analysis, and green marketing. The answer to the problem is to be found not so much in limiting growth, but, rather, in inventing a new kind of "sustainable growth" (Fischer 2017: 67). As a programmatic expression of the neo-liberal approach to environmental problems (Bernstein 2002), ecological modernization seeks to reform –

rather than transform-- the existing political-economic system into a sustainable form of green capitalism (Parr 2009, 2013). Insofar as it resituated environmental discourses within the frame of economic growth, it shifts or softens the argumentation away from the environmentalists; it serves to privilege the already powerful interests of industry over the harsher environmental critics.

The search for new technologies to dramatically reduce carbon emissions is what has been called a “technological fix” (Fischer 2017: 82). Concrete examples of energetic supply are the promotion of solar, wind, and water energy technologies, as well as the spread of biofuels in substitution of gasoline. Similarly, in order to “resolve” the problems of world hunger, geoengineering solutions have been introduced worldwide on the basis of agro-business and genetically modified products, - also defined as a terroristic and violent weapon against the Earth (Shiva 2016). These innovative proposals, notwithstanding widely publicized, are still full of uncertainties of their real potentialities and results. The one thing that is certain is that these strategies would bring (and have already brought) the scientific community to the forefront both in charge of important public projects and into a political role. As a consequence, the risk topic would be more technical than a political issue. As a matter of fact, the eco-modern focus on the technological fix is designed to avoid participatory democratic transformation which is the reason why this democratic deficit represents a real risk (Fischer 2017: 90).

Other critical viewpoints on ecological modernization come from Pellow et al. (2000: 111) who challenge one of the core hypotheses of ecological modernization theory: that the design, the performance and the evaluation of processes of production are increasingly based on ecological criteria, in addition to economic criteria. In particular, through the case of the post-consumer waste recycling system in the US, Pellow et al. identify three critiques of ecological modernization, below summarized.

First, they argue that there is no compelling evidence that the environment has been emancipated from the economic decision-making criteria. In fact, recycling demonstrates the robust character of capitalist production in at least two respects:

- (1) the ability of market criteria to dominate the agenda, even in the face of strong public support for ecological protection;
- (2) the inability of ecological interests to penetrate organizational logics even when market opportunities exist.

Second, the modernization of recycling appears to lead only minimally to a very narrow set of ecological gains.

Third, ecological modernization is focused narrowly on ecological issues to the neglect of other, equally important components of the social process such as social equity concerns.

Pellow et al. (2000) reach the conclusion that any social theory that purports to account for the social process has to incorporate issues of social equity and political-economic power

In short, it is not surprising that the ecological modernization proposals have been depicted as a “weak sustainable” answer to risk (Bruna De Marchi et al. 2001: 101) since it does not tackle the existing inequalities; it does not attack the roots of the problems and, rather, it can generate new injustices. Finally, it is not apt either for an urgent change, since to retool the large economic systems of the world with clean energy through the application of new technology will not be fast enough (Fischer 2017). That said, the crucial point to me and to the interest of this thesis regards more specifically how ecological modernization deals with the production and construction of knowledge by giving most of the emphasis to the role of expert knowledge. In this way, experts are delegated to produce knowledge and their main challenge becomes how to communicate their objective expert knowledge to laypeople. The communication of risk has become an entire topic of discussion and research²⁹. According to Baruch Fischhoff (1995) can be recognized as different steps of communication, from “to communicate the right numbers” to “...what we (the experts) must do is just make them (lay people) partners...” (see also: De Marchi et al. 2001: 83). As I will present in the following chapters, the techno-driven construction of knowledge that delegates to the expert the analysis and production of knowledge about risk and risk territories, while it has been criticized and often debunked in the humanities studies (Chapter 1.4), it has inspired and lays at the basis of the mainstream planning approach to risk (Chapter 1.2).

Despite ecological modernization is the dominant policy-based discourse of sustainable development in Europe mainly inspired by the eco-efficiency principle, some scholars have highlighted how precisely within the sustainable discourse there is a “sustainable gap” (Christie and Warburton 2001) between knowing, by experts and scientists, and acting, by citizen and environmentalists. This gap is reflected in what was named the “equity deficit” i.e., the omission of justice or equity from the most frequently used definitions of sustainability (Taylor 2000).

These unresolved nodes of the theory of ecological modernization find a different answer in another well-known social theory of risk, that is the risk society by Ulrich Beck (1992).

The risk society is “...a systematic way of dealing with hazards and insecurities induced and introduced by modernization itself...” (Beck 1992: 21). The key argument of the risk society thesis is that we have moved, or are in the process of moving, from first modernity (or the industrial society) to second modernity (or the risk society). In industrial societies, the central question involved the legitimate, albeit unequal, distribution of socially produced wealth. In the context of the Risk Society, the problematic consequences of Western technological–economic development has become a key concern, and the “positive” logic of the distribution of wealth tends to be overshadowed by the “negative” one of the distribution of risks (Mol and Spaargaren 1993). As Beck asserted, “...the driving force in the class [industrial] society can be summarised in the phrase: I am hungry! The collective disposition of the Risk Society, on the other hand, is expressed in the statement: I

²⁹ For a broad and detailed picture of the history of science popularization from the Renaissance to the twenty-first century, see Nieto-Galan (2016).

am afraid!” (Beck 1992: 44). The risk society thesis emphasizes the fact that, in the process of achieving more modernity and progress, post-industrial Western societies turn into risk ones: societies in which people are exposed to a whole range of new risks that are beyond the coverage of any kind of insurance. Beck called this condition one of “reflexive modernization”.

By this, Beck meant that Western modernization has led to a transition from an industrial society (simple modernity) to a Risk one (reflexive modernity) and that with it comes the confrontation with self-destructive consequences that cannot be overcome by the systems of industrial society (Blowers 1997). For this reason, the theory of reflexive modernization can be considered modernist in the sense that it underlies the “intensification of modernity” (Bauman 2000). This means that the ecological issues are expressions of success, and not of the crisis of industrialism and our current society (De Marchi 2001: 91). After all, as argued by David Pellow (2009: 3), crises –including the socio-economic and environmental ones- while representing policy failures in the eyes of the mainstream scholars and observers, in fact, can be seen as the result of routine functions of our policy-making apparatus and market-based political economy.

Beck also projected science and technology as the single most important and, at the same time, most problematic foundations in his risk society thesis. In the transition to reflexive modernity, science and technology appear to be semi-modern institutions because they employ old, obsolete ideas to answer new questions. This persistent use of old ideas (e.g., treating societies like laboratories, setting acceptable levels of pollution, considering the lay public as irrational and unscientific, and not valuing its anxieties about environmental issues) and the over-reliance on experts and scientists in relation to ecologically sensitive issues has led to science and technology themselves becoming a significant part of the modernization problem. Under the condition of reflexive modernity, such a situation is what Beck calls a condition of “industrial fatalism” or “organized irresponsibility” (Beck 1992 [1986]). Organized irresponsibility is an unavoidable consequence of the Risk Society. It occurs when the political institutions of modern societies fail to cope with new types of environmental risks (Bronner 1995; Matten 2004). An example can be found on how the power holders are determining levels of pollution using risk assessment methods that have long been defunct.

As political institutions have failed to deal with the seemingly unavoidable consequences of modernity and environmental problems, Beck suggests a whole range of sub-political actors – or “sub-politics”– that he believes has the potential to fundamentally challenge the institutions and agents that generate environmental risks in the Risk Society (Beck 1992 [1986]). Such actors would function separately from the traditional political ones and would have the ability to reorganize societies from the bottom against the politicization of techno-environmental risks in favor of the power holders. In addition, “sub-politics” would have the power to communicate the public understandings of techno-environmental risks to the mainstream political actors and, in doing so, could challenge the monopolistic position of scientific experts and their objective interpretation of environmental risk. “Sub-politics” represent an alternative means of influencing and participating in the once exclusionary political arena controlled by orthodox political institutions (Marshall 1999). These sub-

political actors may include environmental NGOs, print and online media, advocacy organizations, environmental law agencies, student organizations, or any other institutions that operate.

To sum up, on one side, ecological modernization suggests that science and technology are both causes of and solutions for environmental problems (Jänicke 2008; Mol and Sonnenfeld 2000). On the other hand, the “risk society theory” (Beck 1992 [1986]) refers to a systematic way of dealing with hazards and insecurities induced by modernization. The optimistic approach of ecological modernization theory emphasizes the important contribution of modern technology and acknowledges the role played by science in bringing about an ecological switchover and focuses mainly on the technical and economic aspects of environmental change and, even here, draws its evidence from a few Western European countries; conversely, the risk society thesis takes a very skeptical and even negative stand regarding the possible contribution of science and technology to mastering contemporary ecological problems (Mol and Spaargaren 1993). On the one hand, the proponents of ecological modernization theory offer what appears to be a celebration of modernity and of its ability to adjust to the ecological problems created by the industrial society. On the other hand, Beck’s risk society thesis holds that the extension and continuation of industrial progress (or of the typical modernization route to progress) inevitably spells disaster for the environment and, with it, for humanity itself.

This binary approach, even if not always so strict, is perpetrated until our days: on one hand, there are several scholars and policymakers who face the current and future challenges by grounding their research, investments, and projects almost exclusively on techno-driven expert knowledge (Chapters 1.2 and 1.3); from another point of view, there are scholars who have mainly focused on socio-political dynamic animating citizen organizations and on the community's role in building a more democratic knowledge on risk (Chapter 1.4).

While differing in many respects, both approaches, ecological modernization and risk society, claim to capture the complex environmental problems of late modern society. What is relevant is the difference in how in both theories the relationship between expert and lay knowledge and risk promptly came into play. If ecological modernization relies mainly on technological innovations to construct expert knowledge aimed to envision the correct and objective solution, the second relies on social and democratic innovation to build a diffused knowledge and to democratize science for “democratizing democracy” (De Sousa Santos 2007). According to Beck, when political institutions of modern societies fail to cope with new types of environmental risks (Bronner 1995; Matten 2004), sub-political actors should have the power, or, at least the possibility to “culturally interact” (Wynne 1996), to construct “socially relevant transparency” (Elliot and Resnik 2019), and to challenge the monopolistic position of scientific experts and their objective interpretation of environmental risk (Beck 1992 [1986]).

While these theories have provided very insightful and rich reflections on the socio-economic dynamic underpinning the process of environmental degradation, the evolving relationship between the production of expert knowledge and the local knowledge in the comprehension of the risk topics from a cultural and policy and decision-making perspective, I do believe that some gaps are present.

I recognize at least three main critical points in need of more attention:

1) These theories, despite emphasizing the power relations rooted in the dialogical and/or conflictual tension between expert and lay knowledge –after all, it is already quite acknowledged that knowledge and power are two sides of the same coin- however, they left too little space to the injustice underlying the risk. The risk is then waving space and time, but also navigating into the entangled power relationship that can be patent or latent, violent or sneaky. The concept of slow violence can certainly enlighten how environmental degradation embeds power, violence, and injustices.

2) All these cultural and socio-economic theories unraveling the topic of risk in our modern society are not considering two crucial dimensions of this modern phenomenon that are both time and space. Risk is described as a “historical process” built up over time through social relationships, however, the span of time during which the risk occurs has been less taken into consideration. Risk can surf the time with different speeds, paces, and intensities. It can be abrupt or can be slow and diluted into a large span of time. This is for instance the case for what has been called “slow disaster” (Knowles 2018, 2020), “everyday disasters” (Benadusi 2018), or “slow-burning issue” (Mah 2017). I will come back to these concepts later on in the text; at this point it suffices to say that I intercept almost an absence of critical reflections concerning the gradual process of deterioration of the environment and of the socio-ecological relationships occurring within a risk place. Another missing dimension is space. The risk has a geographical and spatial dimension that makes it a territorial phenomenon, having a deep connection with local features even if in the meanwhile it is linked with global trends.

3) I will explore in Chapter 1.2 the work by those scholars who have tried to challenge the epistemological references and the methodological tools to be applied in order to intercept the multi-nuanced forms of knowledge, injustice, stories embedded in risk territories, however, these theories do not really provide a practical indication on how –as researchers and scholars- they actually act and interact.

In light of these drawbacks, I felt the need to look for both epistemological, theoretical, and methodological tools that:

- 1) Are able to unveil the power relationships connected with the construction of knowledge.
- 2) Allow me to approach risk by taking into consideration this spatial and temporal dimension.
- 3) Quest the “position”, both ethical and methodological ones, of researchers and scholars in the construction of risk knowledge.

In order to go through these three points, in the following paragraphs, I will consider how previous theories, studies, and research have dealt with the production of risk knowledge, sometimes being trapped into the expert-lay dichotomies or procedural cages. Finally, I will critically scrutinize the attempts so far to push for a spatial turn into the risk topic by introducing and re-signifying the concept of riskscape as a lens through which to construct a situated knowledge of risk.

The knowledge(s) of risk

As slightly mentioned in chapter 1.1, the awareness to live in a risk society in which new problems, although requiring scientific inputs for their resolution, involve a problem-solving activity that is able to deal with a high level of uncertainty, has spawned a rich epistemological debate on the thorny link between technology, democracy, and knowledge.

Authors, such as Ulrich Beck (1992 [1986]), consider, as we have already seen, that the public -in other words, the uninitiated- mistrust science and experts because the latter have proved to be incapable of foreseeing and controlling negative consequences of science and technology. From this viewpoint, it may be said that science is not a public good, but rather, a "public bad". This crisis of confidence allows modern societies to enter into an "age of suspicion" because the political and economic institutions guaranteeing the validity and legitimacy of science have been found to be wrong.

A different view of this status of crisis is the one by Michel Callon who observes that the crisis is that of the separation between science and society or, in other words, of the great divide between specialists and non-specialists. "This boundary, patiently erected over the centuries, exists not only in institutions but also as models for the actors" (Callon 1999: 82). He suggests steering and altering this boundary through three models explaining how actors interact on practical forms of technological democracy. More in detail, Michel Callon has envisioned three different models, each of which proposes an original form of production and dissemination of scientific knowledge that, in a specific way, combines the nature of the knowledge produced, the modalities of cooperation between specialists and laypeople, as well as the conditions of effectiveness and legitimacy of the decisions taken. From one model to the next, what varies is the degree of involvement of lay people in the formulation and application of the knowledge and know-how on which decisions are based.

In the Public Education Model (Model 1), there is an irreducible opposition between scientific and popular knowledge. No discussion is possible before superstitions, those assumed poisons of democracy, have been eradicated. The public is undifferentiated and its silence is simply the consequence of the "absence of procedures for allowing people the opportunity to speak" (Callon 1999: 88). An undifferentiated public consisting of individuals who act, depending on the circumstances, as citizens and can be distinguished from one another only by their level of knowledge.

The Public Debate Model (Model 2) proposes richer relations between laypeople and scientists. An undifferentiated public consisting of individuals who act; the second model proposes richer relations between laypeople and scientists. An undifferentiated public is substituted by the differentiated public (depending on their condition in life, their professional activities, their locality, age, or sex, etc.). Inquiries, consensus conferences, and public hearings are used to gather the opinions, suggestions, and comments of the different actors or groups of suggestions and comments of the different actors or groups of actors who wish to express themselves. The construction of a public forum for discussion, irrespective of its form, structure, and extension, profoundly transforms the process of public or private decision-making. In these conditions, the legitimacy of

decisions relies essentially on the existence of consultation and open debate. In Model 1 the priority is on the education of a scientifically illiterate public. In Model 2 the right to discussion comes first because laypeople have knowledge and competencies which enhance and complete those of scientists and specialists. Yet, beyond their differences, these two models share a common obsession: that of demarcation between expert and lay knowledge, a demarcation that Callon's Model 3 tries to overcome.

The co-production of the knowledge model (Model 3), tends to overcome these limits by actively involving lay people in the creation of knowledge concerning them. It is possible, in this model, to talk of collective learning, since the different knowledge is mutually enriching throughout the process of its co-production. What distinguishes this model from the preceding ones is obviously the existence of what we have called concerned groups. The legitimacy of this common enterprise, through which new knowledge and new identities are jointly created, relies entirely on the ability of the concerned groups to gain recognition for their actions. Nonetheless, I glimpse a limitation in relying only on the concerned groups in envisioning a do-able co-production model since this does not take into consideration all those populations who are powerless and subaltern, as it occurs in many contaminated places in the world. It is exactly in such contexts that the co-production of knowledge should be put into practice as part of an emancipatory path. Needless to say, the need for a shift from science "speaking truth" to society to the more democratic notion of "making sense together" (Sclove 1995), in addition to stress that only the involvement of unvoiced marginalized people could contribute to obtaining environmental justice, has spawned a rich reflection on how co-production of knowledge can improve the evaluation and interpretation of risk.

To sum up, the cornerstone of Model 1 is the trust that lay people have in scientists; that of Model 2 is the question of representativeness. The viability of Model 3 depends on the difficult conciliation between the defense of minorities, whose identity depends to a large degree on the knowledge produced, and the achievement of a common good that is not carved up by particular interests.

Those models probably do not represent an exhaustive description of the tension existing between expert and lay knowledge; however, they help to furnish an explanation for what is considered the crisis of confidence experienced by techno-science. Contrary to what authors such as Beck maintain, Callon argues that there is no crisis of confidence in science, but a crisis of the regimes, in which the participation of laypeople is based on trust or mistrust.

According to other scholars, the trust and mistrust between the public and experts underpin the public understandings, misunderstandings, and imaginaries of science and policies over the time (Welsh and Wynne 2013; Wynne 1996). Brian Wynne, with reference to the farmers' understanding of science, discusses how the cultural questions of trust and credibility are embedded within changing social relationships. Scientific knowledge tacitly imports and imposes particular and problematic versions of social relationships and identities (Wynne 1996). For this reason, the fundamental interaction between scientific expertise and the lay-public is first of all cultural (Wynne 1996: 21). Either conspiracy approach or arrogance from the experts

makes social identity feel like a specialist community under threat. By conceiving risk in terms of the social relationships over time, and therefore as a historical process, Welsh and Wynne (2013: 541) articulate an analysis from which it emerges that there are two-main public engagements with science that paradoxically coincide with the intensification of State surveillance and policing of the public and social movements engaging with issues involving science. In fact, the process of scientization of politics has entailed an increasing difficulty for citizen groups to question or to propose alternatives to innovations and controversies to be a matter of risk or science. While scientific authorities have been allowed, through undue political dereference, to declare public meaning of techno-scientific innovations and controversies to be a matter of risk or science, public uncertainty or discontent with policy commitments have been depicted as exaggerated and anti-scientific. The institutional science–policy culture’s denial of legitimate political normative differences is manifested in the monolithic insistence on scientific risk assessment as the final arbiter in techno scientific controversies. Acknowledging the limits in scientific predictive control would jeopardize the authority of an institutional culture founded on modernist claims of scientific authority. This legitimacy discourse has become ubiquitous as science is repeatedly invoked in relation to the establishment of political-economic order. Acknowledging the legitimacy of public concerns and meanings that are different from the more narrowly conceptualized risks projected onto the public by scientific authorities would locate political meaning and legitimacy outside of formal scientific-technical realms. Their work unveils how a transition of science occurred from an apparently unproblematic source of presumed public authority to an increasingly contested and ambiguous one, as an insecure institutional agent of neo-liberal global modernity. If in the 1950s the public was imagined as passive non-entities in techno science policies and deliberations, from the 1900s the public has been seen as an incipient threat, and finally from 2000 onwards new commitments to public engagement and dialogue coexisted with a modality which conjured an imaginary of a highly politicized public that required surveillance and policing (Welsh and Wynne 2013: 561).

In order to smooth the feeling of mistrust, some scholars have focused on the role of “good communication” between scientists and the public based on sincere transparency. Although Michel Callon (1999: 89) has already identified the “concerned groups” as the basis of a co-production of a knowledge model, recounting transparency and co-production as unproblematic would be deceptive given the difficulties in experimenting with forms of engagement. In fact, according to Elliot and Resnik (2019), transparency is a very complex concept, including “scientifically relevant transparency” and “socially relevant transparency”.

While the former (e.g., making data publicly available and registering studies) is highly promoted into the open science movement, a strand prone to democratize the process of construction of knowledge transforming scientific practice to make it more transparent, the second needs further steps to provide scientific information in ways that are relevant to decision-makers and the public. To overcome the inadequacy of traditional forms of problem-solving that are no longer able to face through scientific and political decisions the current problems of uncertainty and risks, both technological and environmental one, Funtowicz and Ravetz (1992) have envisioned the post-normal science comprising a dialogue among all the stakeholders in a problem,

regardless of their formal qualifications or affiliations. In order to face the current uncertainty crosscutting the gap between scientific expertise and lay knowledge, the post-normal science calls for the introduction of an “extended peer community” that democratizes science by using “extended facts” i.e., even anecdotal evidence, statistics, and data gathered by the community (Funtowicz and Ravetz 1992: 271). An extended peer community is extended to a “concerned public” i.e., associations and groups of people who are involved in collective actions, which are not reducible to the sum of individual actions. They usually publicly affirm the existence of a peculiarity, that of human beings struck by the same disease, which endows them with a specific, shared identity and distinguishes them from other human beings (Callon 1999: 90).

It is worth pointing out that in post-normal science there is still a distinction between what Funtowicz and Ravetz call insiders (expert) and outsiders (laypeople), based on the side of knowledge, on certified expertise, and on the social side of occupation. Since the insiders are manifestly incapable of providing effective conclusive answers to many of the problems they confront, the outsiders are capable of forcing their way into a dialogue (Funtowicz and Ravetz 1992: 269). After all, if communities have sufficient technical information, they will craft solutions that are environmentally superior to the one-size-fits-all prescriptions generated by conventional regulatory processes (Agyeman 2005).

According to Funtowicz and Ravetz (1992: 269), the popular epidemiology – that is the process where laypeople “...gather scientific data and other information and also direct and marshal the knowledge and resources of experts in order to understand the epidemiology and disease...” (Brown 1992: 269)- displays the struggles for legitimacy by nontraditional researchers. The practitioners, by challenging the established groups on their own ground, try and often are able to affect the public policies. They naturally engage in what could be called a primitive accumulation of scientific knowledge: researching and identifying diseases; organizing and actively participating in the collection of DNAs (Callon 1999: 90). Popular epidemiology is close but dissimilar to citizen science. While the former aims to use the collection of data to challenge public policy, the latter often does not have this political goal of achieving justice. In addition, citizen science despite points at enlarging the base of citizen involved into the construction of scientific knowledge, it is not always rooted on already local knowledge, instead emulate and borrow the scientific and technological tools, without always giving to the knowledge construction process a political and social purpose aimed at both unearthing inequalities and achieving procedural justice. Other methodologies have spread even more, for instance, within disaster risk management is the community-led risk analysis (Goldman 2000) that uses participatory techniques developed by the experts in order to facilitate the engagement of the local community in preventing, adapting, and responding to a possible natural disaster such as an earthquake and floods.

As extended peer communities become more coherent and effective, the political process becomes enhanced with new structures whereby dialogues can be maintained and perhaps controlled. This implies creating those conceptual, procedural, and normative structures allowing such type of “creative dialogue”. In other words, in order to enforce a “political epistemology” (Funtowicz and Ravetz 1992: 270) the concerned groups not only

have to be recognized but also involved in a process of democratization of science as a way to deal with complexity, variability, and uncertainty of our age. In this perspective, the democratization of knowledge may enhance participation in decision making for common problems that is different from Callon's model (1999) calling for “actively involving lay people in the creation of knowledge”.

For these reasons, there is still an ongoing debate on how local knowledge (Fischer 2002; McNamara and Westoby 2011; Cerdán et al. 2012) – defined also as vernacular and placed-based, or particularised knowledge (Krimsky 1984) – may provide valuable contributions to explain situated aspects of an environmental issue and may be a cause and cure of regulatory failure (Bartel 2014). On one side it can be recognized as a certain interest toward the co-production as an empowerment step for marginalized communities, on the other side other scholars have paid attention to the procedural frames that facilitate the integration of local knowledge into the public policy. In regards to the latter, Frank Fischer (2002: 247) has called for a “culturally informed participatory alternative” to expert-led risk assessment that uses “an analytic-deliberative method” capable of bringing together citizens and experts. Fischer’s (ibidem) argument is that the deliberation part “informs risk decisions such as deciding which harms to analyze and how to describe scientific uncertainty and disagreement”. Jason Corburn has dedicated studies and publications to interrogate how local knowledge can enhance procedural democracy on scientific matters (Corburn 2003). With specific reference to the relevance of incorporating the local knowledge about health into the health policy within the American context, Jason Corburn has envisioned the concept of “street science”. Street science is a framework for environmental health justice that joins local insights with professional techniques (Corburn 2005: 3). If typically, in the field of environmental-health decision research, science is seen as “speaking truth” since scientific knowledge is presumed to be shaped outside institutional, cultural, and historical contexts, street science seeks to challenge this idea. Street science suggests that scientific knowledge is always “co-produced”, science and politics are interdependent, each drawing from the other in a dynamic interactive process (Corburn 2005: 4). Corburn points out how street science does not devalue science, but rather re-values the varied forms of knowledge excluded by the professional science and democratizes the inquiry and decision-making processes. Street science is defined as a “process that emphasizes the need to open up both problems framing and subsequent methods of inquiry to local knowledge and community participation” (Corburn 2005: 8). Practically, street science is not one practice but a “set of diverse practices of science, political inquiry, and action” (Corburn 2005: 44). Central to the communicative dimension of street science are stories because they can generate emergent quality of action in context. Actors, who are involved, negotiate reality by telling their own stories. The narratives describing local knowledge often cause confrontation by giving voice to the often-silent suffering of disadvantaged people. The sharing of stories and “personal narratives can demonstrate that others have similar experiences” (Corburn 2005: 65). Therefore, street science, in line with a rich debate in this regard, states that laypeople are often more knowledgeable than professionals and therefore ought to be considered “local experts” (Corburn 2005: 40), rather and even more importantly, local people are more able to deal with complicated social and technical questions than the conventional wisdom generally assumes (Wynne 1996).

When lay people bring science that historically has remained in the lab into their daily lives, the information and knowledge of science must now be valid in both the laboratory and “on the street”, demanding what famous activist of the Love Channel, Lois Marie Gibbs (1994) has called “socially robust knowledge”.

For all that, the contextualized lay understandings of environmental issues are still often dismissed as being merely unscientific or inferior to scientific knowledge (Wynne 1996; Harrison et al. 1998).

More recently, in order to answer this emergence of a change in the way to make science, Isabelle Stengers explains the epistemological reasons why scientists should stop seeing themselves as the “rational brain of humanity” and rather should engage openly and honestly with an intelligent public (Stengers 2018). Consequently, she calls for another science that is based on slow-down science both from an epistemological and methodological point of view. While she introduces generally (and epistemologically!) how the right to slowness means becoming capable of learning again, becoming acquainted with things again, adventuring instead of conquering, reweaving the bounds of interdependency, thinking and imagining, and in the process creating relationships (Stengers 2018: 81-82); she does not indicate how to put in practice those groundbreaking proposals. The two “small drawbacks” of her proposal –i.e., that Stengers did not apply to her own philosophy her criticisms of what Science is doing, insofar as her book has not left her own “Ivory Tower”, ending in cul-de-sacs, possibly highly appreciated by her peers but taxing other readers unnecessarily, and the absence of any implementation (Perezgonzalez et al. 2018)- find an answer in other methodological streams. Among the approaches that have been developed over time with the goal of “going out from Ivory tower” and be part of the change, is the action-research approach. Action-research is a term that is used to describe a knowledge activity that seeks intentionally to determine changes and impacts in reality. Stemming from the assumption that “it is possible to really know only what you are trying to change”, participatory action research is a process in which the researcher is just one among many actors. Her/his/their action is grounded on an inter-action with the contexts and with other social actors most of the time through agreeing upon a partnership (Saija 2016). With the difference with respect to participatory practices, the action-research does not seek to negotiate between different interests among concerned groups; instead, it aims at facilitating the rise of emancipatory identity and awareness in those communities that, otherwise, would be subaltern and oppressed. While the role of the researcher-in-action in tackling and transformatively affecting the structures of power can be found in literature, less easy to be seen, are reflections on triggering such a kind of empowering path. Not always all territories have a history and awareness behind them that allow them to manifest an evident “will to protest and project”, nor to promote a clear request to researchers willing to be involved. Sometimes these insurgent practices are more jagged. In such contexts it is not obvious to use the action-research approach as a way to co-produce knowledge that entails empowerment. Rather the creation of a relational field can be the harbinger of an engagement research path inspired by the principles of action-research and reciprocity between territories and research. The mapping of memories and the granulometry of the social fabric can represent a preliminary step useful for creating that relational field within which to co-produce knowledge of risk and visions for a more just and ecological future (Privitera 2021 a, 2021b; Privitera et al. 2021).

Riskscapes embed knowledge

Citizens own local knowledge accounts for their risk perception, and live the environmental injustices outlining a deeper and multi-view of a territory. This is consistent with the definition of the landscape by the European Landscape Convention as “an area as perceived by people whose character is the result of the action and interaction of natural and/or human factors” (Council of Europe 2000: 2). Stemming from this definition, the collection of “stories of landscapes” (Gravagno and Messina 2008) generates plural perspectives on landscape and allows detection of the social perception of risk and the history and identity of a place. In addition, they tackle the gap between techno-driven and local knowledge, since they bear witness to dynamic interactions of human and non-human communities, enlightening how they have changed over time. Therefore, the landscape can be considered a privileged conceptual tool that overcomes the antinomies between nature and space (Collard et al. 2018), enabling seeing the relationships in between (Pizziolo 2000), and allowing one to find nature in society as well as the social in nature (Armiero 2008: 60). The landscape is a “relational field” (Micarelli and Pizziolo 1998; Micarelli 1999) in which human and non-human components interact and influence each other mutually. Far from being unequivocally linear and deterministic, such links are often complex, polysemic, and conflictual (Pizziolo 2007: 8). To conceive the triad “humans-society-environment” shaping the landscapes in co-evolutional terms (Bateson 1972) means to read the transformations of the landscape through the temporal lens, both in *kronos* and *kairos* terms i.e., quantitative and qualitative. Landscapes are not mere ‘artifacts’ that can be modified according to human design, rather they are living systems in constant evolution with a significant symbolic component (Rackham 1990). Socially constructed with meanings attached by social actors (Greider and Garkovich 1994), landscapes are both material and symbolic (Mercer 2002). Landscapes also have their own agency. Some scholars have proposed extending the concept of human agency to non-humans (Murdoch 2001). Landscapes have the capacity to produce physical and symbolic outcomes from a range of possible alternatives. This does not imply a reification of nature, but rather, it recognizes the capacity of living systems to cause change and generate random responses. In fact, the natural components of landscapes do not always react to human action in a predictable way. Moreover, the physical features of a place will also influence the meanings attached to a particular setting, contributing to a sense of place (Stedman 2003).

This view challenges more determinist perspectives on landscapes, which may fail to acknowledge the uncertainty that characterizes landscape processes. Another way to understand the dual relationship between landscapes and societies is to consider landscapes as places of dwelling (Ingold 2000; Thomas 1993). This implies a lack of distance between people and things; in places of dwelling, humans engage with the landscape through daily practices rather than by detached visual contemplation (Macnaghten and Urry 1998; Thomas 1993).

If the landscapes are made of the human and more than human communities living and shaping it, hence landscape embeds knowledge, or better, embeds many forms of knowledge. In this sense, a spatial turn of risk

is needed in order to take into consideration the geographies of knowledge that characterize the risk. The spatial dimension of risk reveals how risk takes place locally even if in relation with the global trend. This spatial turn into the risk theme is not for sure new.

Contrary to 'word risk', the term *riskscapes* was coined to denote the intrinsic spatial dimensions of risk.

A first germane appearance of the concept of *riskscapes* was in Morello-Frosch, Rachel Pastor, Manuel Sadd, James's work when they described the urban areas characterized by a different distribution of emissions and risk according to racial characteristics with the goal to predict them and define specific intervention strategies (Morello-Frosch et al. 2001). They used a risk assessment approach to chart the distribution by race and income of individual lifetime cancer risks associated with cumulative outdoor air toxics exposures (Morello-Frosch and Lopez 2006). Both univariate and multivariate statistical analyses suggested a significant inequity in what might be termed the *riskscape* of Southern California (Morello-Frosch et al. 2001). In their view, social, economic, and political forces inevitably create myriad *riskscapes* in which overlapping air pollution plumes emitted by point, area, or mobile sources lead to cumulative exposures that pose health risks to diverse communities (Morello-Frosch et al. 2001: 572). While presenting the *riskscapes*, they also analyze how the historical and contemporary racial segmentation of the housing market erodes the property values of Black housing and limits the capacity of Black families to accumulate wealth through home equity (Conley 1999; Oliver and Shapiro 1995). In their work, space plays a role in recognizing the causes and differentiation of risk.

They give prominence to how racial injustice and segregation help to conceptualize risk from a spatial perspective in relation to risk governance. Coherently with a rich family of research originally coming from the Northern American context, their work emphasizes the racial issue due to which the segregation can play out so that certain groups become concentrated, centralized, and isolated in abandoned inner-city cores where employment opportunities are few and where communities are clustered around industrial sites, undesirable land uses, and/or transportation corridors that pose significant health hazards (Pulido 1996a, 1996b).

If this first use of the term "*riskscapes*" originates from a health and environmental studies background, a second more recent application of it stems from a geographical and sociological one. By starting from the meanings of "scapes" as conceptualized by Appadurai (1990) i.e., as something not only physical but rather always embedded in social practices, Müller-Mahn, Jonathan Everts, and Christiane Stephan (Müller-Mahn et al. 2018) provide a wider interpretation of *riskscapes* according to which they refer to temporal-spatial phenomena that relate risk, space, and practice. *Riskscape* links the material dimension of potential physical threats, the discursive dimension of how people perceive, communicate, and envision risks, and the dimension of agency i.e., how people produce risks and manage to live with them (Müller-Mahn et al. 2018). They discuss its applications in risk research and highlight its key arguments with respect to four points: the spatial dimension of risk, the practices of risk-taking, the relevance of group-specific risk perspectives, and the plurality of risk settings.

According to Müller-Mahn et al. (2018), both risks and spatiality are produced in the interaction between social dynamics and material processes, and that this is conceptually relevant: risks are produced through specific (spatial) dynamics (e.g., in the interrelationship between plate tectonics and the designation of earthquake hotspots), but at the same time, they also contribute to the production and transformation of spatial entities (e.g., adaptation of building codes and urban development plans to meet the need for earthquake-resistant buildings).

Müller-Mahn et al. (2018) suggest a systematic reflection on power relations, especially with regard to the role of the State. They also discuss the embeddedness of riskscapes in temporal frames pertaining to different actors, groups, and power structures.

They underline how riskscapes should not be reduced to a simple cartographic approach. Some risks emerging from natural hazards or other physical conditions can be mapped. However, the map is not a straightforward representation of 'a' riskscape but a product of the practices of risk research, which itself constitutes a particular riskscape. In referring to Schatzki's (2010), Müller-Mahn et al. (2018: 202) also conceive the landscapes as plural phenomena.

From an expert point of view, riskscapes can be global (as in global climate change), regional (as in areas of famine), local (as in violence-stricken neighborhoods), or networked (as in energy supply systems). Analyzing spatially overlapping riskscapes, different scales within riskscape research may yield important insights.

In the perspective of Davies et al. (2020), riskscapes are intertwined with social practices. Practice theorists propose understanding all social phenomena as an enmeshed complex of social practices and the material world (Everts et al. 2011). The focus on practices posits that understanding human activity is key to any deeper knowledge of events and states. In this perspective, riskscapes are not just risky territories to be navigated (November et al. 2010); instead, they are also a social construction (Lupton 1999). This is an obvious feature of some places with visible imminent threats, but it can also be a hidden danger, which only comes to light through risk discourse, calculation, or visualization (Aradau et al. 2008). Following Beck's (1992 [1986]) weak social constructionism, risks are not just a feature of places but are also the outcome of specific risk awareness and of socially produced risky situations. Practices of mapping (as with floods, famine), calculation, and extrapolation (as with climate change) co-produce riskscapes. According to these views, the actual significance of the riskscape depends on people's ability to engage, interfere and inflict change. The same holds true for professional and everyday practices of exposing, fighting, coping with, or living with risks.

Therefore, riskscapes "play out in time and space" (Müller-Mahn and Everts 2018: 87), encompassing different points of view on the risk that highlights the "real-and-imagined geographies based on individual and collective experience, tradition and knowledge" (Müller-Mahn et al., 2013: 202-205).

If the "riskscapes playing out in space" has extended the understanding of riskscapes with respect to territorial coverage (Davies et al. 2020: 209), the "riskscapes playing out in time" have entailed reflections on the time scale of risk, both in terms of duration and speed.

Quite emblematic in this sense are the riskscapes due to the pollution occurring slowly over time. The existing literature in this regard refers to pollution landscapes where "pollution is embedded in all aspects of everyday life" (Castán Broto et al. 2007: 492). People dwelling in a pollution landscape may have a holistic view of it, in which all the environmental and social elements seem to be interconnected. Under a holistic view of the landscape, one possible strategy to cope with pollution may be to continue 'business as usual', as if the risks were nonexistent. There are several examples in the literature in which risks caused by chronic pollution may become integral accepted parts of everyday routine. For instance, people may just 'get used to it' (Sapountzaki and Chalkias 2005). Local people may find it difficult to separate the pollution issues from other material concerns embedded in the surroundings (Burningham and Thrush 2004).

A pollution landscape is not only one where some of its elements are polluted. A pollution landscape also requires the social construction of the landscape as a malevolent environment, which conditions the lives of those dwelling in it. In a pollution landscape, atypical and unfamiliar phenomena are perceived as symptoms of pollution landscape, atypical and unfamiliar phenomena are perceived as symptoms of the hazardous nature of that landscape.

According to Greg Bankoff (2009: 265), when the category of disaster cannot be mobilized to define extraordinary "events" because they entail slow, continual, and often latent "processes", such as industrial pollution, the result may be what he terms the "normalization of threat". These kinds of chronic, everyday disasters are more likely to remain suspended in uncertainty, and uncertainty surrounding not only their underlying causes but also their long-term, not clearly evenementiel effects. Indeed, constant exposure to adversity makes it harder for people to recognize the state of vulnerability their local communities are exposed to, driving them to resort to categories of invisible forces, neglect, and denial to define their daily experiences of the disaster.

I argue that extending the concept of risk landscapes (or riskscapes) to all those everyday slowly polluted landscapes can provide a privileged conceptual tool through which to read the uncertain and unjust socio-ecological relationships due to the current risk society.

Specifically, this thesis provides a re-signification of industrial risk as an emblematic example of "slower-burning issues" (Mah 2017) "everyday" (Benadusi 2018) and "slow disasters" (Knowles 2018, 2020). Industrial risk and potential damage, such as toxicity and contamination, are never locationally limited and discrete – in terms of both time and space – but always invisibly and violently diffused into human and nonhuman communities living in and shaping landscapes. This wider interpretation of riskscape better links the riskscape concept to the slow violence concept. By slow violence, I directly refer to Nixon's definition

(2011: 2) of that violence occurring "gradually and out of sight, a violence of delayed destruction that is dispersed across time and space, an attritional violence that is typically not viewed as violence at all".

I argue that so far, the concept of riskscapes was not able to grasp and include all those slow, gradual and diffused burning issues. While the concept of riskscapes by Morello-Frosch and colleagues (Morello-Frosch et al. 2001; Morello-Frosch and Lopez 2006) regards the spatial and geographical distribution of risk, and the concept of riskscapes by Müller-Mahn et al. (2018) is presented as a conceptual methodological tool through which to consider the social practices (Davies et al. 2020), my understanding of riskscapes, in addition to including these previous interpretations, aims to take into consideration the transformations occurring slowly over time. It encompasses the slow everyday disasters due to multi-nuanced forms of (in)visible violence producing injustice and power relations, but also struggles and reactions.

While all these theoretical speculations on riskscapes try to entail the cultural, geographical and spatial distributions of risk and environmental impacts, they take less into consideration the socio-economic and power structure that subtends our current risk society i.e., what is missing is a wider interpretation of landscapes in order to achieve a "just riskscapes".

In this research, I will build upon the concept of "riskscape" and merge it with the concepts of "slow" (Knowles 2018, 2020) and "everyday disasters" (Benadusi 2018). In fact, the riskscape at the core of my research is one produced by industrial contamination where harms are the products of long and gradual processes of environmental degradation and entwined failures of nested sociocultural, political, and technological issues (Gray-Cosgrove et al. 2015; Knowles 2014).

Final remarks

In this chapter, I tried to analyze the debate on risk with the goal of emphasizing its main characteristics, potentialities, and gaps by giving particular attention to the construction of risk knowledge. In the first part of this chapter, I went through the main "risk theories" from the 20th century and I did a more detailed comparison between three of them: the treadmill of production, the ecological modernization, and the risk society. While the first has given a fundamental contribution in linking the socio-environmental despoliation and losses with our current (nowadays globalized) capitalistic system, it has given less space, with few exceptions, to critically engage and question how this treadmill of production may entail and be connected with a sort of "treadmill of scientific production of risk knowledge". Diversely, both the ecological modernization and risk society theories, notwithstanding do not investigate in depth the socio-economic reason underpinning our reflective modernity, they involve and unravel in depth the role of technology and of experts in dealing with risk. More specifically, the ecological modernization points to the expert knowledge and technology to face the imminent risk (from industrial pollution to climate change) by relying on what is defined as the "technological fix", without applying any critical approach, for instance, to the environmental impact that the growth vortex

stimulating technological advancements may produce. On the contrary, the risk society highlights that technology is the cause of current risk and cannot be the only solution. Rather, an appeal to a democratic improvement through the involvement of sub-politics may be a solution.

After I have critically presented how these main theories about risk have engaged the production of knowledge, I went through the epistemological and methodical debate that constitutes the theoretical frame guiding the relationship between expert and lay knowledge. If Callon has provided some models of this interaction and has pointed out how the co-production one requires further development, other scholars have incited for an epistemological turn toward what has been defined a "post-normal science" that, by including an "extended peer community", it is able to better deal with the uncertainties characterizing the current risk society. If theoretically the public understanding of science and its co-production has been widely formulated, this literature has not offered very practical suggestions on how to actually convert this theory into practical tools of co-production of knowledge that can be rooted into the real local contexts, while, simultaneously, democratize technology, democratize democracy and trigger collective learning and emancipation.

The search for a multifold and situated process to construct knowledge has led me to the need for a spatial turn toward a more overarching concept of riskscapes that is able to catch alternative and deeper spatial data and meanings. I analyzed the existing literature on the concept of riskscapes and what I found is that, despite this literature has embraced risk landscape as a complex multi-layer concept from which to read and analyze social, cultural, racial, and environmental inequalities both from a distributional but also more theoretical and methodological point of view, it has not included all those phenomena occurring slowly in time and space. Similarly, the concept of pollution landscapes is also missing from this temporal scale. In order to include a more varied and comprehensive knowledge of risk, I argue that it is needed to equip with a broader interpretation of risk landscapes that is able to catch slow violent burning issues.

1.2 Gaps and challenges in the construction of knowledge in/on risk landscapes in “mainstream” planning

In this chapter I seek to shed light on how urban studies and planning have concentrated their attention on ecological modernization, big data, and smart city to face risk and environmentally wicked problems, rather than embracing the insights coming from the current debate in socio-environmental justice studies. Both the confrontation on interspecies justice, ecological design, and on the role of communicative and action-research planning to achieve spatial justice, “just city, transition, and sustainability” have not robustly impacted the rhetoric on eco-efficiency in the mainstream planning debate and laws, especially in the “slow disaster” of toxic and contaminated landscapes.

The mainstream planning approach to the risk landscape

If the human settlements have been always exposed to sudden natural disasters, epidemics, and dangerous hazards, the discourse on risk assessment came into play in the planning debate much more recently and mostly in Western countries. Nevertheless, it would be an interpretative and narrative mistake not to recognize that the planning itself, actually, is very much connected with the rise of risk, even if it was not named in such a way. In fact, humans have attempted to design and construct their own habitations in accordance with logic and effective solutions aimed to optimize the space and resources and to reduce possible natural disasters since the most ancient times, as well as utopian visions of better future worlds have always been present, nurturing the practical practices. A turning point in the history of the production of cities occurs in relation to the development of modern industrial cities after the middle of the 19th century.

It was in this period that modernist planning took shape in the attempt to bring “order, cleanness, beauty” and above all rationality in the urbanized areas in order to face the illness and overpopulation in the main European capitals due to the explosion of irregular urbanization following the massive urban drift from rural areas of flocks of poor farmers searching for jobs. The dream of a rational city – that is of the modernist notion of technical rationality providing order, coherence, regulation, homogeneity (Sandercock 2003a: 2)- permeates uncountable modern urban plans, investments, and interventions spread through Western Countries. These aim to give a spatial dimension to the rational and objective interpretation of all those sanitarian, socio-economic, and environmental problems abruptly increased in the urban areas due to the massive industrialization. Quintessential projects of this period in the history of modern planning include the top-down intervention in Paris at the hand of Georges-Eugène Haussmann, the Barcelona plan by Ildefonso Cerdà, as well as, in the Italian context, the renovation plan of Naples that was enforced in order to contain further cholera contagion. These plans were elaborated with the purpose of solving sanitary and environmental urban problems related to water management, air quality conditions, and sewer systems, especially present in slums and high-density

poor areas, by means of the most technological and engineering means. Despite the rational city planning of the 19th century already making an effort to tackle the reduction of the infections and of collective pandemic risk by elaborating and proposing concrete spatial blueprints to be enforced in several European countries, academics will have to wait until the second half of the 20th century to debate it.

Another feature pertains to the fact that all these transformations were State-driven and based on the "new" conception of the state's role having as a central purpose the improvement of all members of society, their health, skills, education, longevity, productivity, and even their moral and family life, in line with the Enlightenment belief in the interdependent links between the perfectibility of Man and the perfectibility of the social order. Finally, another aspect to consider is the position of the planner in respect to the construction of knowledge implemented in the cities. Holding this "creative mandate" (Saija 2012: 15), groups of experts, concentrating intelligentsia, rationality, and expertise and having a privileged position of power, used to choose for the rest of laypeople and inexperienced citizens and issue orders and directions from their own "ivory tower". With epistemological roots into the Cartesian dichotomic approach between *res cogitans* and *res extensa* - according to which there is an ontological polarity between "thinking" and "being" with the first proving the second "*cogito, ergo sum*"³⁰- the planning has followed the principle of objectification and of separation as a method to understand and transform the world and the cities. Due to the affirmation of the primacy of scientific knowledge over any other form of human knowledge, the scientist is definitively assigned all the gnoseological responsibilities of society. The scientist takes the place of the rationalist thinker, bringing about a profound transformation in the nature of the process of technical knowledge. The quality of the scientist's work is almost entirely linked to their methodological rigor. The creative aspects of the gnoseological act are therefore reduced to a minimum: to the expert from whom has been removed all forms of irrationality and emotionality.

This rationalist Cartesian philosophical matrix finds further corroboration in the scientific positivist and deterministic assumptions that directly stem from the pure scientific world and having blind trust in progress and faith in scientific advancements science. This general enthusiasm reaches its pinnacle during the 19th century when the planning processes and plans start to take inspiration from the scientific methods and discourse. At this time, urban planning can be seen as the (or better one of) children of modernity, since it absorbed the legacy from positivist and deterministic approaches. The first is a philosophical system holding that every rationally justifiable assertion can be scientifically verified or is capable of logical or mathematical proof, therefore, recognizing only that which can be demonstrated through logical or mathematical proof, the second, often crossed and nurtured by the first, is the belief that all events are determined completely by previously existing causes to which follow some precise and predictable effects. Or, paraphrasing Donald Alan Schön, the technical rationality became the "positivist epistemology of practices" (Schön 1983: 40).

³⁰ Usually translated into English as "I think, therefore I am".

While uncertainty was acknowledged, it was believed that the only limits to knowing the laws of nature were scientific or epistemic; that we could conquer uncertainty and predict future outcomes by having better science. Knowledge was seen as capable of knowing what is to be known (Chandler 2014).

According to Leonie Sandercock (2003a: 64) "this was an era that was intoxicated with the idea of progress through reason, of perfecting the good life on earth guided solely by the light of reason, which would free men's minds from the bonds of superstition and ignorance. Liberty, equality, and fraternity were its slogans. In epistemology, the claim was that the world could be known objectively. The practice and logic of physical science involved hypothesis-testing through experiments and careful measurement. Rigorously applying this 'scientific method' would result in the discovery of universal laws about the world of material facts".

Videlicet, from scientific determinism to spatial– environmental determinism the jump was brief.

The mainstream history of planning depicts the rational planning of the last two centuries as heroic and progressive, mainly relying upon the rise of liberal democracy, the progress through science and technology, and the faith that "the rational planning of ideal social orders" can achieve equality, liberty, and justice (Harvey 1989). As a consequence, the planners were portrayed as experts who use expert knowledge to comprehend and act in the world and who utilize the laws of development to provide societal guidance (Beauregard 1990: 385). Leonie Sandercock (2003a: 31-33) identifies six pillars of this mainstream planning seen as a "modernist project" which are: to make use of rationality to carefully consider and evaluate decision-making options and alternatives; to aspire to comprehensive planning that utilizes multi-functional/multi-sectorial spatial plans based on integrative, coordinative, and hierarchical functions; to ground on scientific method and positivism approach and to be inclined to apply quantitative modeling and analysis; to consider the planning as part of the modernization state-directed project; to conceive the planners as in the position to know what generally is best for people by operating in the public interest; to deem the planning as value-neutral and apart from politics.

While Leonie Sandercock (2003a), acutely knocks the vision of mainstream planning in the service of modernization, industrialization and of material growth as progress, in order to argue the need of an insurgent and radical planning in the multicultural cities of the 21st century, Laura Saija (2012) reviews the epistemological roots of the modernist planning in relations to both the potentialities and criticalities of the figure of planner and the learning mechanism into the planning processes. In particular, she examines how the rationalism approach, by giving prominence to the reflection over the acting, affects the relationship between planning and learning, in a way that planners think that they need to learn in order to plan, instead of using planning in order to learn. The first implies that any decision needs to have a preliminary learning process according to which take a choice, the second, taking inspiration from Dewey's works on the action-relevant knowledge and learning by doing, entails that the planning process itself becomes a learning and emancipatory moment of transform-action: all themes that can be found into the action-research paradigm (Saija 2016). In light of this distinction, modernist planning may be pedagogically interpreted as centered in the education that

is issued by expert technicians to ignorant masses of people on how to live in a “modern” and “organized” manner and on what “beauty” means. In this sense, Le Corbusier's projects -showing people how to dwell in modern and standardized houses and cities and stating that “the plan must rule” (CIAM 1933: 7)- concentrate quite emblematically the educational purpose of modernist planning.

As a matter of fact, during the 20th century, the aforesaid philosophical and epistemological background underpinning the rationalist planning of the 19th century not only endured but took the shape of what Leonie Sandercock (2003a) defines as the “mainstream modernist planning approach” of which Le Corbusier and modernist projects are a quite iconic example. More in details, according to what can be considered the modernist manifest, i.e. the Charter of Athens (Congrès Internationaux d'Architecture Moderne [CIAM] 1933) -the brainchild of a group of avantgarde architects, planners, and urbanists who set up CIAM in the 1930s- a good city was a city in “a state of equilibrium among all its respective functions” (CIAM 1933: 3). The Charter described cities of the early 20th century as being in a state of “chaos” because of “uncontrolled and disorderly development, leading to increasing congestion, overcrowding, disorderly use of land, chaotic functional relations and spreading blight”. In other words, the modernist planners reused the same discursive devices applied during the 19th century to demolish and reconstruct entire urban historic fabrics, often socially depressed and lived by the working class, in the name of sanitarian renovations. According to Simin Davoudi (2019), the modernist planners conceptualized space as an absolute, neutral container, that is a bounded entity in itself, independent of people, objects, and events. This static view of spatial relations had a profound influence on the architecture and planning practices of the post-war era and led to the top-down and inflexible blueprint plans that left their mark on numerous cities and towns around the world.

In the post-second-world war, the planning processes have been mainly expert-driven and plans were presented to the public as *fait accompli*. Planners believed that a functional equilibrium and a steady-state in the city could be achieved by the commanding power of the plan (Davoudi 2019). It is in the same period that the planner emerged as a profession, and consolidated around a central team made of social science which emphasized rationality and objectivity as an unfathomable, added value. In the western countries, including in Italy, the main classic books about planning says statements such as: “the urban planning discipline has a determined dimension, a scientific stature (...) the territory and the city become a field of investigation, it is needed to construct a cumulative knowledge (...) to agree on a common formal language made of recognizable symbols. To overlook what creates order, systematize the society inhabiting the neighborhood (...) in order to do so, it is crucial to trace the clear borders with other adjoining disciplines that are architecture and sociology” (Astengo 1949). In other words, according to Giovanni Astengo (1949) -who is one of the many “illuminist leaders” of the Western planning scenery- the planning is a technology of decision and science of urban society of the future. The legacy of the mainstream approach is still present in the public administration and praxis and its cultural, political, and scientific agenda may be synthesized as follows:

-the structure of the world is equal to the structure of the description - it is fundamental to make a unique description;

-the subject who knows (observer, scientist, planner) and the object to be known are separated. As a consequence, the object can be split into more parts and its explanation is ascribable to the explanation of these single parts (in line with a reductionismo approach);

-it is not only possible but also necessary and urgent to predict the events in order to manage and control them;

- the worlds, the city, the society can be treated as a simple machine to be undergone to general laws (see Le Corbusier);

-the plan is a technical tool to enforce, communicate and realize prefixed purposes (Scandurra 2001).

This theoretical, epistemological, and methodological imprinting of mainstream planning affected the way planners have dealt with urban risk, in particular the one coming from earthquakes, natural and hydrogeological disaster. In order to give a few illustrative examples, in Italy, the flooding of the Arno in Florence in 1966, as well as the landslide in Belice Valley in 1968, has inserted into the planning debate the need to better comprehend and map the potential areas in danger by also influencing the Italian normative. In all these cases, those risks, that were not yet explicitly treated as risks, were faced by using mainstream planning approaches. Much more absent has the debate into the planning field regarding the industrial risk that has been mainly delegated to techno-engineering solutions and norms (explained further in chapter 1.4). From the '80s planners have relied on the development of tools such as the multi-criteria analysis to tackle the risk. Opponents to the use of multi-criteria analysis state that the method is prone to manipulation, is very technocratic, and provides a false sense of accuracy. Proponents claim that multicriteria analysis provides a systematic, transparent approach that increases objectivity and generates results that can be reproduced (Bonte et al. 1998). The transparency and the possibility to really access data and be involved is a thorny point inside the risk and planning. For a long time, the different public perceptions of environmental and industrial risk, sometimes leading to protests, criticism, or resistance in the public sphere, was seen as a pure problem of information and public ignorance, which could be solved by effective risk communication (Bickerstaff 2004). According to this communication thesis, explaining scientific and technical information effectively would bring citizens' ideas about risk closer to the experts' ideas (Tesh 2000). This hierarchy between expert and lay knowledge has been a common thread of the mainstream planning, and above all when the main concern is the risk, with few exceptions. In the 1960s, the rise of systems theory (cybernetics) powered by computer modelling gave planners even more confidence about their ability to predict the behavior of urban systems by unpacking the behavior of their component parts. That, in turn, would enable them to control the future trajectory of the city through technical-rational planning procedures.

The mainstream planning has mainly followed ecological modernization suggesting that science and technology are both causes of and solutions for environmental problems (Huber 1982; Jänicke 2008; Mol and Sonnenfeld 2000). Planners have faced risk challenges by grounding their researches, investments, and projects almost exclusively on techno-driven expert knowledge. A consistent strand of planning has borrowed the technocratic epistemological and methodological way to make research and reckon with the risk topic historically facing the risk topic through high-techno-driven ideas. It depends on abstract models built through algorithms and quantitative methods. The cornerstone of this approach is the formula $R = P \times L$, where risk (R) is equal to the product of probability (P) of a disruptive event and the loss (L) caused by the event (Kaplan and Garrick 1981). This formula aims to measure the expected loss connected to the occurrence of an unwanted event. These mere quantitative approaches have shaped both planning and laws on the several layers of risk governance, especially at the European and Italian level. The techno-positivist approach has entailed extensive investment in high technologies and more recently in smart devices that allow the collection of Big Data. Despite the existence of alternative families of theories and practices that are less simplistic and reductive in describing risk, there is a substantial mainstream planning claiming for the neutral and objective position of this formula.

Everything but neutral, the mainstream planning not only has to do with epistemological and methodological issues, but also with power and socio-economic ones. How the old reductionism and mainstream planning have intersected with power (and above all, economic power) dynamics has been the core of critical urban studies.

If the city can be considered a “synecdoche” (Marcuse 1964: 62), i.e. a projection of the society into the spatial territory, to deal with urbanization means to deal with industrialization. In the light of the interpretation made by Lefebvre but also by David Harvey and other neo-Marxism scholars, the development of the city (intended in the marcusian aforesaid definition) can be understood through the dialogical and conflictual relationship between urbanization and industrialization. Because of the latter, the urban reality has attributed mostly an “exchange value” that has commodified it and has lost the “use value” made of relations, emotions, cultural and social aspects (Lefebvre 1991). In this perspective, the modern city is seen as the result of “new customers” ready to invest and shape the city (Scandurra 2001).

The French geographer distinguished three types of urban planning:

1) the planning of man (human) of good effort usually linked to classic or liberal humanism in which architects assume the role of doctors or creators of society and want to build a “human scale”, at best this tradition leads to formalism or aestheticism, as well as to the strand called “culturalism”; the latter, despite critical respect to the myth of progress, was not really able to beyond the “praise of the settlement forms of the past” (Choay 1965).

2) the urban planning of the public administrations insists on being scientific. This scientism, which accompanies the deliberate forms of operational rationalism, tends to neglect the so-called 'human factor'. One extrapolates from science, from a fragmentary analysis of the reality considered. One optimizes information and communication into a model. This technocratic and systematized planning, with its myths and its ideology (namely, the primacy of technique), would not hesitate to raze to the ground what is left of the city to leave a way for cars, ascendant and descendant networks of communication and information.

3) The planning of developers. They conceive and realize without hiding it, for the market, with profit in mind. What is new and recent is that they are no longer selling housing or buildings, but planning. With or without ideology, planning becomes an exchange value. The project of developers presents itself as an opportunity and place of privilege. This type of planning is diametrically opposed to the concept of cities as places for people, not for profit (Brenner et al. 2012).

The interplay between this epistemological positivism, deterministic, rationalism strand, and the capitalistic interest lay at the basis of the "lovely paradox" of the urban planning of the 20th century (Sandercock 2003a) and of the neo-positivism trend that characterizes it.

According to the neo-positivism approach to the project and urban planning, there is a division between researchers (pure scientists) and designers/planners (experts in applied science). According to this view, to each group the society has entrusted specific responsibilities: to scientists the task of producing a body of knowledge widely applicable to concrete problems, to practitioners (planners) the task to incorporate into their methodological expertise of problem resolution the most recent scientific researches through also normative responsibilities. In this division of task, the epistemological aspects have an absolute hegemony over the decision one (Saija 2012: 66). The link between theory and practice is determined by a sort of "knowledge box" that must be filled by scientists and is designed to the fruition of practitioners.

The neo-positivist schools have met the capitalistic global trend in dealing with increasing environmental risk by means of techno-driven solutions mainly by basing on quantitative-deterministic approach, instead of using the lens of environmental and social justice until nowadays. The much-promoted concept of Smart cities is, in my perspective, a more recent example of the mainstream quantitative-deterministic approach. In particular, the notion of Smart Cities has gained much traction in recent years as a vision for stimulating and supporting innovation and economic growth and providing sustainable and efficient urban management and development as an answer to the increasing risk, uncertainties, and crisis. The techno-positivist approach has entailed extensive investment in high technologies and more recently in smart devices that allow the collection of a large amount of data (Big Data [BD]). The main driven-thinking goes that if technology is a tool that can make cities cleaner, more efficient and wealthier, then the high-technology must be inserted and implemented within our daily living spaces. The resulting increase of smart and high-technological devices and systems within private and public spaces entails the collection of Big Data that needs to be managed. Big Data is huge in

volume, high in velocity, diverse in variety, exhaustive in scope, fine-grained in resolution, flexible, and scalability. Big Data is an extremely large data set that may be collected, analyzed, monitored and calculated computationally by smart devices to reveal patterns, trends, and associations, especially relating to human behavior and interactions. Big Data offers a “predictability of routine” conceived as a high point of progress but also as a concrete expression of the “banality of power” because the routine is the foundation of power, since the normalization of routine supports the techne of power, while making it part of everyday (Datta and Odendaal 2019: 388-389). In addition, as Rob Kitchin (2014: 12) argued, Big Data also raises a number of concerns with respect to the politics of such data, the technocratic governance, the corporatization and further neo-liberalization of city management, the possibilities of a technological lock-in, the system vulnerabilities, the ethical issues with respect to surveillance, dataveillance and control, as well as other concerns relating to data quality, fidelity, security, the validity of analytics that utilize data dredging techniques, and how data are interpreted and acted upon.

It is worth noting that the label of Smart City has been supported by several governments and public administrations all over the world, it has turned into defining policy push for most national and supranational entities, including the European Union that has financed many research projects on Smart Cities and Big Data, often involving the world’s largest software services and hardware private companies. Given the role that such systems are likely to play in shaping urban governance, there is a pressing need to interrogate the nature and production of urban Big Data, the composition, and functioning of urban analytics and control centers, and the implications of technocratic, corporatized and real-time forms of governance. A similar opinion has been stated by the mathematician Cathy O’Neil in her book “Weapons of Math Destruction” (O’Neil 2016) in which she defines WMDs as algorithms that are opaque, have a large impact on society and harm the most vulnerable of citizens. After all, as Bruno Latour (1999: 304) predicted “the more science and technology succeed, the opaquer and obscure they become”. The black-boxing phenomena has at least two interconnected effects: less possibility for normal citizens to understand and to know the internal complex process within the technology; and a better panoptical control on the society as a consequence of the lack of knowledge and of the surveillance systems. Since Smart Cities can be seen as an embodiment of state governmentality (Datta and Odendaal 2019: 388), the extreme attempt to reinforce the technological progress, as well as the mathematical formulations and the modelization of complex processes through algorithms, may represent a weapon of math destruction that intensifies the discrimination and social gap that already exists, instead of improving them. The crucial point here doesn't regard the advancement of technology itself, but how to use it, who uses it and with what final purpose.

Although the technical-rational approach still dominates planning practices in many parts of the world, it has been significantly challenged by new developments in spatial theory (Davoudi 2019: 124). This challenge, plus the entrenched technical-rational mind set and blueprint planning method, has led John Friedmann (1993: 482), one of the great planning theorists, to suggest that, “The conventional concept of planning is so deeply

linked to the Euclidian mode that it is tempting to argue that if the traditional model has to go, then the very idea of planning must be abandoned” (Davoudi 2019: 126). To plan in our current risk society means to plan under the conditions of fluidity and uncertainty. According to Simin Davoudi (2019), to face uncertainties “we need to move away from technical, rational, and blueprint planning and embrace what may be called adaptive planning” (Davoudi 2019: 125). The current risk society has been mainly tackled with techno-driven approaches and focused on urban resilience, scientifically and evolutivally. The engineering resilience denotes “the ability of a system to return to equilibrium after a disturbance” (Holling 1973:17). This means that the resistance to disturbance and the speed at which the system returns to a state of equilibrium constitute the measures of the system’s resilience. The faster the system bounces back, like a spring, the more resilient it is. Applying this idea to the socio-spatial contexts implies that a resilient city is a city that is able to recover and return to how it was before a crisis. Evolutionary resilience is not about bouncing back to normality, but about the ability to change, adapt, and, crucially, to transform in response to sudden shocks or cumulative pressures (Carpenter et al. 2005). Here, resilience is not a fixed asset or a trait, but a continually changing process. It is not a being but a becoming that may emerge when systems are confronted with shocks. In the social context, this means that people may become resilient not in spite of adversities but because of them (Davoudi 2019: 124).

Another attempt by planners to mitigate risk comes from the nature-based solution in planning. This field interplays techno-driven solutions with more traditional ones in order to face climate change and drastic changes of our environment. However, critiques stress that too short emphasis has been given to the justice topic within this debate (Cousins 2021) above all in relation to the nature-based solution to the slow and long-term environmental issues due to industrial contamination (Song et al. 2019).

In the light of what I presented in this first part of this chapter, it is clear how the mainstream planning, rooted into the rationalism and positivism approach of the 19th century and further developed through the 20th and the 21st century, despite inserting several novelties and decisive solutions, have been not able to catch the injustice, power mechanisms and socio-economic aspects underpinning environmental risk. On the contrary, in many cases, the planning practices have increased just inequalities as well as the gap between expert and lay knowledge.

Thus, the planning - imprisoned into a point of view in which the knowledge privileges the technic rationality, the problem-solving ability, and the objectification of the phenomenon - seems to be just slightly scraped by the participatory and ecological practices and theories during several years (Gravagno and Messina 2008: 61), as well as scarcely touched by risk debate if it were not that the “noir of planning history” (Sandercock 2003a) were unearthed by emerging and innovative epistemologies, theories, and practices over the last three decades. Among these innovative epistemologies, theories and practices, there are:

- the criticism of the rational comprehensive approach to planning, (Sandercock 1998);

- the innovative theories and practices, from communicative planning to the radical planning and insurgent planning practices, that have challenged the stratified exclusions and injustices of the city both from a procedural and recognition point of views;
- the theoretical efforts for formulating an urban theory of justice (Fainstein 2010),
- the numerous works by some American scholars aimed to theorize just sustainability theories through the interplay between the sustainable groups and the social justice issues (Agyeman 2005, 2013);
- the call for the spatialization of justice (Soja 2010);
- the reflections welcoming and reformulating the influence of theory of complexity in the ecology of planning (Pizziolo 2000; Micarelli and Pizziolo 2003a; 2003b); the more than human discourse.

Without claiming that I will unpack all these strands and family of planning theories and practices in an exhaustive manner, in the next section I will try to go through those planning stances that are alternative to the presented mainstream one in order to question and bring to light how they have faced the current risks by intertwining social and environmental justice and by bridging and blurring the borders between the different types of knowledge.

Seeking (Environmental) Justice

Despite rationalism affecting most of the planning practices over the last centuries, other strands of planning have emerged over the 20th century. Nowadays, the old reductionism has been substituted by an intellectual attitude that endorses an irreducible multiplicity of points of view, the idea of autonomy, moving the focus and interest from the control to the interconnection.

Beginning in the 1960s, scholars of urban politics have criticized urban decision-makers for imposing policies that exacerbate the disadvantages suffered by low-income, but also minority residents (from black people to females, from gays to ethnic minorities). In particular, they have condemned policies that favor downtown business while ignoring neighborhoods in need and giving priority to tourist facilities and stadiums over school and labor-intensive industries. Among them, some scholars have already concentrated upon the social and environmental urban justice in relation to capitalistic profit and power, concerning the process of production of the city (Lefebvre 1991), the effect of the turbo-capitalistic profit (Luttwak 1998) and the relationship between space, time, place, and nature (Harvey 1996). Groups operating within a neo-Marxist paradigm emphasized the structural underpinnings of the system and basically argued that equitable planning could only occur after a complete transformation of the system of private property.

In the U.S.A., the equity, reformist and progressive planners (Forester and Krumholz 1990) have aimed to construct policies through which to provide a wide range of choices for all those residents having fewer possibilities of choice. Simultaneously, "reformist planners" in Italy, historically engaged in the construction of normative tools, have sought at guaranteeing the fundamental rights of citizens-inhabitants through the management and the public control of territory and the formulation of the minimum standards for public spaces and places of collective interest (Campos Venuti and Oliva 1993)³¹. For both these experiences, American and Italian planning, conceived as an activity of management and control of the territory by the public institutions, has the task of carrying out the public interest. This - if needed - may also mean carrying out a battle against private capital, financial interests, and global corporations. According to this view, planning aims to achieve justice and equity (Rawls 1971). The principles of equity and justice lay at the basis of the communicative and participatory planning according to which most is the amount of the people who are involved and represented, most, consequently, is the justice that may be achieved, consistently with the idea of procedural justice. According to Susan Fainstein (2010: 66) "participatory mechanisms primarily became a vehicle for middle-class interests. As such, they represented a move toward democratizing the planning process but not usually in the direction of redistribution and they always posed the threat of cooptation". If procedural justice approach's supporters follow what was assumed by Rawls on how a just process will lead to just outcomes since institutionalized citizen participation increases the information available to policymakers by providing local knowledge, making, decision-making more democratic and open, other scholars calling for a more "substantive justice" stress that this "does not make it necessarily more equitable" (Fainstein 2010: 67). More particularly, it is assumed that active citizenship is the best means to secure progressive change and practitioners are urged to be reflexive in all that they do. In this regard, another inherent feature in the procedural approaches is that despite dealing with enormous issues they merely leave the values hidden from scrutiny, under a myth of value-neutrality. According to Heather Campbell (2006: 103) the recent history of planning, especially with regard to the participatory planning processes, thought has seen the replacement of the planner as instrumental rationalist by the "planner as a facilitator". In both these positions, the emphasis is on the neutrality of the planner and hence on appropriate procedures and due process, although of a very different nature in each case. The planner's position as neutral evokes the legacy from the rationalism approach. Nonetheless, whether planners choose to acknowledge the values implicit in their actions or not, "planning can never be neutral" (Campbell 2006: 98) because achieving justice brings in ethical issues. According to Campbell (2006: 92) "justice in planning is about situated ethical judgment—a conceptualization of justice that raises significant issues in relation to future developments in planning thought". For this reason, "putting values back into a concept of justice in planning" (Campbell 2006: 101) means that planning is about an engagement with questions of value, not merely individual preferences; instead, values are interpreted in a relational and collective sense. As a consequence, a "relational understanding of justice" is necessary in order to avoid

³¹ More recently the Italian planner, Bernardo Secchi, has focused on the polarization between "cities of riches" and "cities of poor" (Secchi 2013).

narrow and essentializing forms of localized justice (Campbell 2006: 104). Only by doing so, planners may work out what is significant from what is not, the legitimate from the morally unacceptable.

The same goal of justice and equity was pursued by “advocacy planning” that, on the contrary to reformist planning, is mostly anti-institutional planning that takes sides of particular interests expressed by a community. Having roots into the American movements against the renewal project in the ‘60s-‘70s in the American slums and launched by Paul Davidoff and his students, the advocacy planning regrets any supposed position of objectivity, rather declares its radical position that, most of the time, is in opposition with the State decisions (Davidoff 1965). It is worth noting that in the advocacy planning model, professionals work on behalf of poor communities in the role of engaged consultants who are in charge of constructing knowledge, rather than co-constructing together with the community partners. While this strand of planning has not directly dealt with the risk knowledge, it has been groundbreaking in dismantling the idea of a neutral position of planners in respect to spatial decisions.

More recently several types of planning that Friedmann calls Innovative planning have emerged in contrast with the more traditional allocative planning and with the aim to explicitly obtain structural systemic changes. Among these, transactive planning seeks to transform knowledge into action through a continuous sequence of interpersonal relationships (Friedmann 1973: 171). By the dialogue and the sharing of values, it generates collective mutual learning processes. In this regard, previous works have emphasized how the planning itself can play a “pedagogic function” (Saija 2012) that engenders learning processes and empowerment. In line with the theoretical elaboration by Friedmann there is the reflective practice by Schön regarding the ability to reflect on one's actions to engage in a process of continuous learning (Schön 1983). His “reflexive knowledge” seems quite far from the traditional concepts of rational expertise obtained through formal and specialized education. It is more similar to a “form of art” that can be developed by means of experience, having creative features stemming from the uncertainties of daily acting. As maintained by Laura Saija (2012: 114), despite it epistemologically challenges and innovates the practice of constructing knowledge, “the reflexive practitioners’ theory does not deeply affect the relationship between expert and society, while it keeps a level of action more strictly technical”. In my perspective, Schön's definition of knowledge, while overcoming the technology-guided process underpinned its construction, opens to unusual tools and ways to produce it that seem to me as in line with the post-normal science appealing for “extended facts” already discussed in chapter 1.1. Another clarification comes from Heather Campbell and Robert Marshall (2006), who points out that in order to practically acknowledge the importance of questions of substance and, more particularly, value in relation to justice in planning, practitioners should not be only reflexive, but they should quest about what to be reflexive about. This is because planning is concerned with making ethical choices about better and worse with respect to specific contexts. Planning is also about action, more particularly collective action, based on a “relational understanding of human existence” (Campbell 2006: 94). Making decisions involves determining what is important and significant in a particular situation and places. Those decisions unlikely are made so as

to please everyone; in fact, making ethical choices over issues is often a highly contested field (Campbell and Marshall 2006).

More recently, a more “European” version of the communicative planning is the collaborative one (Healey 1997) that is institutional planning aimed to provide “infrastructures for the democracy” (Busacca and Gravagno 2006) i.e. conceptual and real spaces in which the conflicts can be hermeneutically approached (Gravagno 2002), creatively faced (Sclavi 2007) so as to affect the urban plans, produce institutional innovation, and trigger social changes (or better, social innovation)³².

Nevertheless, it is not always possible to rely on the ability of institutions to take on their own responsibilities in dealing with complex issues, such as related to the risk. It is precisely in all those contexts characterized by weak institutions that a deep social change is even more needed and in which, according to Laura Saija (2016), a planning that embraces an action-research paradigm may give birth to emancipatory paths enabling citizens to ask for a better democracy and for a more “just society”, while involving the public institutions in mutual learning processes (Saija and Pappalardo 2020).

A more explicitly declared commitment to the topic of justice comes from radical planning whose aim is the social transformation in the interests of greater social, economic, and environmental justice. Originating from a meditation on radical practice by a group of engaged academics/planners/activists, the radical planning points at the radical social changes by involving trained professionals as change agents in partnership with mobilized communities, even if it may be attempted with and through the state in those historical moments when political parties with a radical agenda have captured state power (Sandercock 1999). However, the option of State-driven progressive planning seems increasingly unavailable to planners - this is why Leonie Sandercock (1999; 2004) detects a new form of progressive planning, the insurgent planning that has begun to emerge from bottom-up experiences. Insurgent planning operates in the interstices and even in the face of power and, according to Sandercock (1999: 39) “if we want to achieve greater social justice, less polluted environments, and broader cross-cultural tolerance and if the planning contributes to those goals, then we need a broader and

³² In recent years social innovation has become more and more central into the European debate. Social innovators pursue change through innovative actions that combine financial autonomy and social inclusion. Social innovators can be informal groups, social enterprises, cultural associations, other types of nonprofits, a coalition, or a combination of all or some of the above. Most are focused on social service provision (Ciampolini 2019), cooperative housing (Lang and Novy 2014), cultural activities (Ferilli et al. 2017). Many play an increasingly important role in urban regeneration processes (Christmann 2020) due to the spatial nature of most of their actions. Innovation takes often place in decayed, abandoned, deprived buildings and/or open spaces that get re-activated, restored, re-furnished, re-used (Ostanel 2017). Some scholars look at authentic and inclusive social innovation as a good sign of what they call the return of the political (Swyngedouw 2014), the ability of social groups that are threatened by urban elites to exercise their right to the city (Harvey 2003). But several studies demonstrate that there is always a risk of distortion and cooptation by ‘power’ (Rossini and Bianchi 2020).

more politicized definition of planning's domain and practices". The word insurgent implies something oppositional, a mobilizing against one of the many faces of the state, the market, or both, this exemplifies the word of insurgent because it challenges existing relations of power. Insurgent planning may be stories of resistances, and not always successful, as well as of resilience or of reconstruction. Also, it may achieve social transformation only partly. Most likely, insurgent planning practices produce "a thousand tiny empowerments" (Beard 1999) instigated by mobilized communities, acting as planners for themselves (Beard 1999; Paba and Paloscia 1999). The insurgent planning entails a political position that while, evidently, turns down any rationalism presentation of neutrality, holds an intentionally political position that questions alternative forms of knowledge, especially by using storytelling (Sandercock 1999, 2003a) and other biographical expressive forms. In my perspective, the supporters of insurgent planning have the merit of having challenged epistemologically and methodologically both the role of planners in society and how planners seek to construct knowledge. I want to stress that while there is a quite vast literature on the insurgent planning and practices (Sandercock 1999, 2003a), it cannot be noted the same about the insurgent knowledge. If "crisis of value entails crisis of knowledge" (Friedman 1987), then to point to a city based on progressive and alternative values should mean changing the way to construct knowledge. However, there is almost an absence of works regarding the jump toward an experimentation with insurgent knowledge, especially in contaminated subaltern places. Reflective and empirical gaps that I hope to explore through my research.

Notwithstanding this strand of planning wishes to connect planning theory with other theoretical discourses - specifically debated around marginality, identity, and difference, and social justice in the city- because these are debates that empower groups whose voices are not often heard by planners (Sandercock 1998), both the topic of justice and of risk have most been tackled by planning debate through, respectively, the growing discussion of "just city" and "just sustainabilities".

About the topic of justice into planning, it is worth noting that the theories of planning have embraced the procedural, substantive, distributional, and capabilities theories of justice. More generally it has been argued that the inevitable abstraction in liberal theories of justice comes so close to idealization that their ability to help individuals and societies to address the question of "what is to be done?" is seriously called into doubt. This in turn has led to concern that an adequate account of justice should be able to link abstract principles to the context-sensitive judgment of particular cases (Campbell and Marshall 2006).

A concern with justice can lead to policies that foster the equitable distribution of governmental revenues, produce a lively, diverse, and accessible public realm, and make local decision-making more transparent and open to the viewpoint of currently excluded groups. Since the development of practical alternatives to the status quo and neoliberal hegemony becomes the primary task for those with a moral commitment to human betterment, Susan Fainstein recommends non-reformist reforms directed at improving the lives of residents of cities within Western Europe and the US.

According to Susan Fainstein (2010: 3) "just city is a city in which public investment and regulation would produce equitable outcomes rather than support those already well off". As she declares since the beginning of her book, her effort is to develop an urban theory of justice and to use it to evaluate existing and potential institutions. Fainstein's work aims to create an argument for a normative framework promoting the (more) just city, with the goal to use it to evaluate existing and potential institutions and programs. She re-signifies justice as encompassing equity, democracy, and diversity: all features of the just city that should bear on all public decisions as well as to be expressed in a set of norms by which to direct and evaluate policy. With the intent of specifying programs that would benefit relatively disadvantaged social groups and of calling on policymakers to make a kind of justice impact statement when choosing particular strategies, she identifies the kinds of policies available to local decision-makers that are likely to increase justice, she applied those three criteria to analysis of three cities, New York, London, and Amsterdam in order to identify their "just city level". In other words, in her view, by pressing for justice on decision-makers, consistent change may be made. Nevertheless, how exactly to carry on such a pressing is not explained. She maintains that if justice is the goal, the requirement of democracy, and therefore all the procedural issues connected to it, is mainly instrumental, without it, those with less power are likely to be treated badly. By giving less priority to democracy than to equity, Fainstein (2010: 14) conceived justice as the consensual outcome of deliberation under hypothetical ideal conditions. Therefore, in Fainstein's opinion, making justice the first principle by which to evaluate urban planning and policy is essential and is not met without ascribing to it a substantive content. It is the substantive content of the discourse, not simply the process by which it is conducted that matters if justice is to be the outcome. Fainstein's argument is that it is possible to list criteria by which to formulate and evaluate policy. The particular policies that best satisfy the criteria will vary according to time and place, but the fact that we cannot specify *ex ante* the most progressive policies does not mean that we cannot establish bases of judgment.

While Fainstein has the merit of having prominently brought in the planning debate the relevance of justice, some critiques may arise. First, her contribution is grounded on an institutionalism vision that, while it searches for specific normative justice theory of planning and of urban policies, lacks of consideration of all those contexts in which institutions are fragmented, weak, or even the first perpetrators of forms of injustice (Pulido 2017; Pellow 2018)³³. Similarly to her view, Moroni (2019) stresses that public institutions are the true subject of social justice, in other words, questions of urban justice are intrinsically questions of institutional justice. Therefore, the predicate social justice is a predicate to be directly applied to public institutions, this means to underline that a judgment of social justice or injustice applies to the institutions that form the basic framework within which various situations occur. While I agree on the relevance of public institutions in reaching a more just city and society, I do believe that to consider them as the "paradigmatic subject of social justice" (Forst 2012: 25) jeopardizes the recognizing of the citizens' efforts in self-organizing for experimenting with

³³ Interestingly in this sense it is noting how this institutionalism perspective drastically clashes with the one coming from some EJ scholars who see in the State the first perpetrator of injustice! see Pellow 2018 and others.

alternative just solutions and, in the meanwhile, diminishes all those injustices purposely committed by the public institutions. These weaknesses turn to be even more patent in all those distressed and marginalized contexts, in which the ambiguity and immaturity of public institutions are juxtaposed to powerless communities, of which the Sicilian case I will present later on is a quite prime example.

Another lack of the “just city” theory regards the almost absence of the relation between justice and environmental topics. Fainstein declares that “the arena of environmental policy raises particularly difficult questions of equity and democracy” (Fainstein 2010: 53) but in her theorization of just city does not dedicate any specific focus at this, apart from a mention to how the environmental justice movement has addressed the tension between equity and the location of environmentally hazardous facilities. However, in her view, in environmental policy often the most efficient way to achieve objectives is to invest in programs that primarily benefit the well-off – that is, programs to remove land from potential development, thereby raising the price of available housing sites, or subsidizing new, higher-density construction in inner cities that promote gentrification. In this regard, I believe that a considerable effort comes from the work by Julian Agyeman and other scholars who, in order to bridge these theoretical gaps between (environmental) justice and sustainability discourse in planning, have envisioned the concept of “Just sustainabilities” (Agyeman 2005, 2013; Agyeman et al. 2003).

More in detail, just sustainabilities proposal moves from the recognized need to promote a “cooperative endeavor” (Schlosberg 2007) between the new environmental paradigm and the environmental justice paradigm because “sustainability cannot be simply a “green”, or “environmental” concern, important though “environmental aspects of sustainability are. A truly sustainable society is one where wider question of social needs and welfare, and economic opportunity are integrally related to environmental limits imposed by supporting ecosystems” (Agyeman et al. 2002: 78).

The “Just sustainabilities” seeks to integrate the social need and welfare into the sustainability discourse making it more just by doing so and it can be defined as “the need to ensure a better quality of life for all, now and into the future, in a just and equitable manner, whilst living within the limits of supporting ecosystem” (Agyeman 2003: 5)

There are four essential conditions for achieving just and sustainable communities of any scale, that are:

1. Improving our quality of life and wellbeing
2. Meeting the needs of both present and future generations (intergenerational and intergenerational equity)
3. Justice and equity in terms of recognition (Schlosberg 2007)
4. Living within ecosystem limits (Agyeman 2005: 92)

In my perspective, the merit of Agyeman does not dwell only in his effort to call for this both paradigmatic and “movement fusion” (Agyeman 2005: 4)³⁴ between, respectively, new environmental paradigm and sustainable discourse and environmental justice paradigm, environmentalism groups, and environmental justice movements, but also in his effort to look at the relation between the theoretical dimension and the practical one through ongoing practices inside the cities. While he was envisioning and arguing the importance of just sustainabilities paradigm (Agyeman 2005), he has also tried to apply it concretely by analyzing three themes permeating our cities, that are food, space and place, and culture (Agyeman 2013). Especially his last publications are centered more and more around food justice and complete streets practices (Alkon and Agyeman 2011; Agyeman and Zavestoski 2014). In other words, in his works can be read a virtuous tension between theorization of environmental justice within the planning debate and an attempt to use this theory to better investigate and comprehend the reality. Nevertheless, it seems to me that all the rich reflections coming from the innovative and progressive planning traditions of engaged and radical researchers and planners have not found a further development in this anyway groundbreaking effort by Agyeman to interplay the environmental justice quest into the planning theories and analysis. Despite just sustainabilities is, at its very heart, a “political construct rather than a technical or scientifically objective notion” (Agyeman and Evan 1995: 36) having the policy goal of “over-arching societal value” (ibidem), however, the concrete proposal of Agyeman (2013) consists “just” in using the co-production to engender alternative economic models, i.e. models that see people as assets rather burdens, invest in their capacities, and uses peer-support networks in addition to professionals to transfer knowledge and capabilities. Agyeman argues that achieving just sustainabilities will require a shift from current reformist strategies towards policy, planning, and practices for transformational change. In a similar way to the insurgent planning practices, Agyeman sustains that a transformation of society and an understanding of emergent and transformative change mechanisms are needed to achieve just sustainabilities. These change agents will have to engage with many challenges, including questions of value(s), difference, culture, and identity and that this revolution will be co-produced, however, what exactly to do to co-produce emancipatory knowledge that is able to achieve simultaneously sustainability and justice is a lacuna in his work, that would have implied both an epistemological and above all methodological discourse.

Finally, differently from Fainstein’s just city that provides a quite exhaustive normative overview but does not really descend upon the spatial dimension of injustice, in my opinion, Agyeman’s work is able to enlarge the justice discourse to the current urban issues without, nonetheless, to go in depth into the spatial dimension of environmental justice in order to have which Soja’s work is more emblematic.

³⁴ The movement fusion can be defined as “the coming together of two (or more) social movements in a way that expands the base of support for both movements by developing a common agenda” (Cole and Foster 2001: 164).

Edward W. Soja introduces spatial justice as "an assertive and explanatory spatial perspective that helps us make a better theoretical and practical sense of how social justice is created, maintained, and brought into question as a target for democratic social action" (Soja 2010: 2).

The geography, or "spatiality" of justice is an integral and formative component of justice itself, a vital part of how justice and injustice are socially constructed and evolve over time. If the spatial dimension has traditionally been treated as a kind of fixed background, a physically formed environment that, to be sure, has some influence on our lives but remains external to the social world and to efforts to make the world more socially just, Soja's book grounds on a dynamic idea of space that challenges the typical way to look historically at the social, and point at scrutinizing and comprehending it spatially or geographically. According to Soja a spatial turn to read social injustice can open up new sources of insight and innovative practical and theoretical applications. Acknowledging the existing mutually influential and formative relation between the social and the spatial dimensions of human life, each shaping the other in similar ways, allows using the notion of a socio-spatial dialectic for reading how social relations and societal development just, as much as social processes, configure and give meaning to the human geographies or spatialities in which we live.

In other words, the spatiality of (in)justice affects society and social life just as much as social processes shape the spatiality or specific geography of (in)justice. The purpose of Soja is to amplify and extend these concepts into new areas of understanding and political practice. In this view, everything that is social (justice included) is simultaneously and inherently spatial, just as everything spatial, at least with regard to the human world, is simultaneously and inherently socialized. Seeing justice spatially aims above all at enhancing the general understanding of justice as a vital attribute and aspiration in all societies. It seeks to promote more progressive and participatory forms of democratic politics and social activism, and to provide new ideas about how to mobilize and maintain cohesive coalitions and regional confederations of grassroots and justice-oriented social movements. By analyzing the diverse ways unjust geographies are produced, reproduced, and responded to at three different but overlapping arenas of social action, roughly definable as exogenous or top-down, endogenous or bottom-up, and meso-geographical or regional, conceived as the in-between spaces where the macro and the micro, the global and the local, converge, his intent is to illustrate the multifaceted nature of the struggles over geography and to exemplify the range of contexts that can be explored from a spatial justice perspective. Soja also points out how the local knowledge and regional awareness encouraged larger-scale perspectives, linking local movements not only to state and federal levels but to the global justice movement and the revival of struggles over the right to the city.

While Soja overcomes the mere neo-marxism interpretations according to which the struggles over the right to the city are mainly reduced to struggles against capitalism, and recognize that there are many other forces shaping these unjust geographies (despite he does not mention very explicitly the State), a point he highlights -and that is functional to my path through the planning field- regards the call for an interplay between environmental justice movements and spatial justice. In his opinion, "the search for spatial justice

must connect more closely with the environmental justice movement and help to redefine and redirect existing movements against globalization, neoliberalism, global warming, species extinction, nuclear weapons, religious intolerance, and torture of any kind" (Soja 2010: 199). In other words, very differently from, for instance, the search for a theory of justice by Fainstein, Soja purposely stresses the relevance of grassroots movements engaged with environmental justice in order to interpret spatially the socio-environmental injustice permeating and shaping the space. While his book is entirely dedicated to support a theory for spatial justice and the significance of a spatial turn into the justice topic, what is further interesting to me is the historic background that has let him reach such reflections. In fact, through a long-term partnership between engaged scholars and researchers with local grassroots organizations who were protagonists of turmoil in Los Angeles in the '80 and '90s, Soja has given shape to his spatial justice theory while was actually committed to concrete actions for achieving more spatial justice. The combination of such facts has represented the roots into which to merge knowledge and action and to elaborate his theory about the spatial justice that, indeed, is the fruits of years involved as an engaged researcher with justice movements.

If Soja's works has the merit of having theorized the involving of spatial justice into the environmental, geographical and urban studies, also in this case few attentions have been given to tools to put in practice to construct collective knowledge, especially in those places where the environmental issues are slow burning issues (Mah 2017).

It is worth mentioning how the spatial dimension in analyzing the injustice in the cities can be found in the urban political ecology, especially in some research connecting right to the city and green gentrification (Anguelovski et al. 2017, 2019). These works, through attentive examination and combining planning and critical urban studies, unearth the power unbalance to the detriment of powerless communities, such as the homeless (Dooling 2009). In my opinion, both Laura Pulido and Julie Sze quite well represent what, consistently the previous speculations (Armiero et al. 2019b; Bandiera and Bini 2020), I have already defined "undisciplined scholars" (see chapter 1.2.) i.e., those who do not fear trespassing the borders of disciplines to shed light on the socio-economic and environmental injustice interconnected with all those areas considered at risk and of "sacrifice". Laura Pulido (1996), as well as works by Raquel Morello-Frosch, Jim Sadd, and Manuel Pastor (2001) have spotlighted how environmental and health inequalities are produced and reproduced in Los Angeles. They added a strong spatial and locational emphasis to the evolving environmental justice movement, linking issues such as air and water pollution, the reduction and disposal of toxic wastes, and the misuse of toxic chemicals to ongoing research on urban restructuring, regional and community development, and new industrial technologies. Pulido calls for a critical analytical approach to race in environmental racism denouncing how environmental justice and racism research has been "estranged from social science discussions of race" and is divorced from concerns of geography, in particular, how racism produces geographic and spatial inequalities" (Pulido 2000: 12).

Likewise, Julie Sze has dealt undisciplinably with environmental risk. In her "Noxious New York" (Sze 2007), she examines the culture, politics, and history of environmental justice activism in New York City intersecting planning and health and changes in garbage and energy systems as a result of privatization, globalization, and deregulation. With this study she illuminates the larger social and political meaning of urban environmental justice activism by closely examining the operations of justice, knowledge, and power in the postindustrial global city, drawing from theories on race and discourses of justice. She underlines how the production of environmental racism and the social construction of the environmental justice movement follow similar processes of identity production through the spatialization and racialization of pollution and environmental politics. She applies a racial and spatial ways of thinking about urban space through which she gives prominence to the historical links between planning and public health (and their divergence) and to how the urban environmental justice activism seeks to reconnect the fields of public health and urban planning through its concern with health disparities in environmentally influenced diseases such as asthma (Sze 2007: 19). This undisciplined approach allows her to look at how activist groups have shifted their focus from fighting siting proposals of individual noxious polluting facilities to actively engaging in and community-based environmental health research processes that are necessary to the democratization of science.

To sum up this part of exploration into the planning schools of thoughts related to the risk landscapes, I tried to revise and underscore how a mainstream and rationalist planning has dealt with the risk mainly through a techno-driven approach. This strand has inherited the legacy of the rationalism and, consequently, of the ecological modernization approach to the risk that, however, is at the basis of the so-called "organized irresponsibility" (De Marchi et al. 2001: 157). In addition to the smart and technocratic discourse, planners have tackled the contemporaneous uncertainties by mobilizing a wide debate on the various forms of resilience or by experimenting with concrete proposals of eco-design built on nature-based solutions. This first strand of planning mostly relies on expert knowledge to guide decision-making while essentially, they do not give sufficient relevance to the socio-economic and environmental inequalities as well as to the power dynamics that -by contrary, as I have explained in chapt 1.1. and chapt. 1.2. have been the core of the many fields of knowledge, such as environmental justice studies, environmental humanities and political ecology.

It would be defective not recognizing that, despite the persistence of a rationalistic and modernistic mainstream approach, during last decades within the planning have emerged alternative strands of theories and practices that have brought revolutionary epistemological and methodological novelties. These groundbreaking works have focused on the drawbacks of the progress most of the time to the detriment of more powerless communities, have questioned how the engaged works of planners may have been more at the service of marginalized and powerless communities, and, simultaneously, they have theorized how to bring in the topic of justice into the planning debate in a way that involve institutions for obtaining more procedural justice, while others were focusing more on distributional or substantive justice. Only more recently, a push has

occurred toward the inclusion of the environmental justice movements and studies into the planning field. The spatial turn in analyzing socio-economic and environmental justice has influenced both the geographical, urban studies and the urban political ecology researches. However, it is worth noting that those works still are the result of niches and borderline experiences. And also, they mostly disregard the environmental risk as a complex and territorial phenomenon involving the concept of landscapes in all its nuances. In order to find similar reflections, another family of scholarships should be taken into consideration, how I will unfold in the next section.

Relational planning to complexify the approach to (risk) landscapes

It is worth noting that since the 20th century, many studies and theories have debunked the disciplinary dogmas nestled into, for instance, the rationalism and positivism approach to planning. If the myth of neutrality has been challenged by advocacy, radical and insurgent planning strand through their emphasis of the political commitment, other families of theories have affected extremely the theory and practice of planning during the last century starting with the assumption that the environmental issues and related risk were a complex topic entailing multifold features of territories so that a mere executive or reductionist approach would be not enough able to catch that complexity. The attempt to broaden in this direction the planning may be found at least in two stances of reflections, one coming from the environmental wicked theory, the another one stemming from the efforts of experimenting with the application of the theory of complexity and of the ecology of mind into the planning. Both have started to lay the foundations to insinuate, into the scientific world, the collapse of the myth of objectivity.

The first stems from the assumption, introduced by the authors of the essay "Dilemmas in a general theory of planning" (Rittel and Webber 1973: 160) that "planning problems are inherently wicked". The kinds of problems that planners deal with-societal problems-are inherently different from the problems that scientists and perhaps some classes of engineers deal with. Rather, planning problems are inherently wicked and even more when they have to do with environmental risk. According to their explanation the information needed to understand the problems depends upon one's idea for solving it. In other words, every question asking for additional information depends upon the understanding of the problem-and its resolution-at that time. Moreover, the problem can not be defined until the solution has been found, and the formulation of a wicked problem is itself the problem! The process of formulating the problem and of conceiving a solution (or resolution) are identical, since every specification of the problem is a specification of the direction in which a treatment is considered. In the wicked problem literature, it is possible to divide the problems into two main paradigms (Kreuter et al. 2004): tame problems, which are the ones for which there are scientifically based protocols that guide the choice of solution(s); and wicked problems, whose solution(s) is (are) based on "judgments" of multiple stakeholders. Wicked problems are the ones managed by planners. The definition of

the planner is generally referred to the wideness of the territory-making processes. In a tame problem the definition of the problem itself unveils part of the solution, the causes of a problem can be determined by experts using scientific data and the task is completed when the problem is solved. On the other hand, a wicked problem has different characteristics. For instance, it cannot be definitively formulated, it has no 'stopping rule' and it is always unique (and so is its solution). A solution to a wicked problem is not 'true-or-false' but tends to be 'good-or-bad'. This typology of resolving cannot be tested, and there are innumerable solution options. Solutions to wicked problems are not true-or-false, but good-or-bad. Every wicked problem is essentially unique and can be considered to be a symptom of another problem. The choice of explaining a wicked problem determines the problem's resolution. This typology of problem cannot be solved, at best it can be only resolved – over and over again. An example of a wicked problem can be represented by climate change management. In this case, the global warming phenomenon can be interpreted in its causes and solutions as a social, cultural, economic, environmental, urban, and political problem (Levin et al. 2012). Rittel and Webber (1973) recognize two planning generations. The first generation thinks that a planning project can be organized into distinct phases, but its systems-approach is inadequate for dealing with wicked-problems. The second generation should be based on a model of planning as an argumentative process in the course of which an image of the problem and of the solution emerges gradually among the participants, as a product of incessant judgment, subjected to critical argument.

The second contribution regards the influence of the theory of complexity and of the ecology of mind on the planning field. While the advancement of disciplines has entailed an extreme fragmentation of the sectors of knowledge, producing, as result, an incapacity, or at least difficulties to frame specific issues in connection with wider problems, by contrary, the call for a "complex thought" involves the tight bond between science of ecology, earth science, cosmology. His multidimensional approach to human nature—and to inquiry there are problems, such as the human/nature or two culture splits, that must be approached with a radically different way of thinking, a way of thinking that, as Morin states, is not disjunctive (either/or), but connects (Morin 2000).

This multi-trans-disciplinary vision approaches the problems and issues as a whole i.e., in a holistic way. Also, by stemming from the ecology theories, the theory of complexity takes into consideration the (eco)system as an autopoietic organization that is able to be retroactive and, therefore, to learn from the feedback. This totally breaks with the reductionism dogma coming from the rationalism thinkers. A revolutionary concept was the learning of first and second level at the center of the work by Gregory Bateson (1972). The word "deutero" comes from the Greek word "deuteros", which means second, next, or farther from. The term deutero-learning was coined in 1942 by the anglo-american anthropologist Gregory Bateson. Bateson distinguishes between two levels of learning, proto- and deutero-learning. These levels of learning are simultaneous. The term deutero-learning describes the context in which (proto-)learning processes occur, i.e. those cases in which a person "learns" not only what is supposed to learn (in a common-sense understanding), but also how to learn.

To re-discover of the interconnected ecosystem has generated a flourish cycle within academia and scholars shedding light on how almost all (eco)systems in nature are complex and fruits of their self-organization interactions. The solution cannot be to dissect the complex ecosystem in parts and then just to recompose it back. In order to comprehend such complexity, the relationship shaping it must be explored and understood. These reflections have been further developed inside the planning debate, for instance by Simin Davoudi who maintains that under the condition of fluidity and uncertainty, we need to move away from technical, rational, and blueprint planning and embrace what she named “adaptive planning” (Davoudi 2019). Adaptive planning is premised on a different understanding of space and place. Instead of thinking about space as a bounded physical container, we need to think about it as relational, fluid, and contingent; as being socially and culturally constructed through the interactions of people, objects and events. As David Harvey states (1996: 53), following Henri Lefebvre, our social interactions, “do not operate in space-and-time, but actively construct” them. In this relational geography, “cities and regions are seen as sites of heterogeneity juxtaposed within close spatial proximity, and as sites of multiple geographies of affiliation, linkage and flow” (Amin 2004: 38). In line with this strand of reflections, Giorgio Pizziolo and Rita Micarelli have called for an injection of renewed space and dynamism into the development of three ecologies that are: the ecology of nature, the ecology of mind and the ecology of collectivity all triggering a conscious co-evolutionary ecology (Pizziolo 2000; Micarelli and Pizziolo 2003a, 2003b). By questioning the reopening of new relationships modalities (anthropological, natural, and collective) means to re-invent an evolutionary, or better a co-evolutionary perspective thanks to which shed light on the homology of process, more than for structures. “The homological correspondence between mental learning processes and evolutionary processes of living things -the ecology of mind and nature- becomes the epistemological orientation that also guides us towards the identification of the role of the creative process and, therefore, of the project in the widest sense” (Pizziolo 2000: 54). By conceiving the project as stochastic process par excellence, Pizziolo envisions an ecology of planning that, understood as one of the latest cultural updates of traditional planning, to a new overall conception of the project itself, to arrive to a totally innovative creative process within its epistemological framework. The ecology of planning must rediscover its means of expressing its creative dimensions, which can pass for the above-mentioned modalities, but which will have to rediscover a specific dimension of its own, both within its own tradition and within the new perspective of an ecological aesthetic. The ecology of design permeating the Micarelli and Pizziolo work’s can be found in the concept of deep design as an ecology of collaborative encounters enabling innovative place making processes (Manzini 2015).

A crucial contribution coming from these reflections regards how it impacts the landscape's concepts and planning. The landscape is defined as the new aesthetic expression of the ecological relationship between

humans (man!)³⁵-nature-society and a manifestation of information (Pizziolo 2000: 59). In other words, Micarelli and Pizziolo envision further practical and speculative devices in order to propose an ecological approach to the planning design and planning based on this evolutionary vision of the relationship of human-nature-society. According to this ecology of planning, the project is an art of relations and the planners are totally surrounded and inside /immersed into a relational field of reciprocal modification with the other living beings and places. In this way the landscape itself becomes the melting pot of the people living in it and of their point of view. Only by capturing the deep quality of the cultural and biological relationship that links every citizen to his/her/their place of life can be possible to put together the complex perceptive puzzle constituting the landscapes (Micarelli and Pizziolo 2003a; 2003b).

Starting from this complexity, the ecology of planning envisions the landscape as a relational field (Pizziolo and Micarelli 2003a, 2003b) in which human and nonhuman components interact and influence each other mutually. Far from being unequivocally linear and deterministic, such links are often complex, polysemic (Pizziolo 2007: 8), and conflictual. We argue that exploring those conflictual ties is extremely productive because they expose the structure of power embodied in nature (Armiero 2008: 60). I will explain in chapter 2, tools such as autobiographies and small data enable the hermeneutics of conflicts (Gravagno 2002) underlying the understanding of the dynamics of the transformation of places.

The ecology of the point of views, i.e. the interwoven and juxtaposition of the different territorial representations, is then possible to complexify the “story of the territory” (Busacca 2000) and make denser the image of the city and places in which humans interact with other worlds. Similar concepts are the core of the so-called Italian “territorialist school” (Magnaghi 1990, 1998, 2010, 2020) made of several scholars who have dedicated their studies to articulate and give depth to the concept of territory. The territory has been defined as a common good with its own historic, cultural, social, environmental, and productive identity and considers landscape to be its visible manifestation. Following the territorialist approach, sustainability is referred as the activation of systemic relationships between the natural environment, the built environment, and the anthropic environment in which to produce high territorial quality as a precondition for sustainability. All these works are coherent to what the already quoted definition of landscape as “an area as perceived by people whose character is the result of the action and interaction of natural and/or human factors” (European Landscape Convention 2000: 2). The territorialist approach, and the following studies belonging also to other disciplines, conceive the landscape as a privileged conceptual tool to read the polysemic and often conflictual relationship shaping landscapes. The territorialist and relational approach, beyond being theoretically formulated, have been experimented in the field during the last decades, especially in some experience of river contracts (Pizziolo et al. 2019) and collaboration partnership, in prominent ways in the Italian region of Tuscany. A

³⁵ In most of the literature, except for the ones of the last decade, the author(s) use(s) “man” instead of human and or more inclusive terms.

particularly relevant previous work that originates from the just mentioned cultural and theoretical bedrock is the one by Salvo Messina and Filippo Gravagno (2008) who have done the effort to further develop and apply such epistemological and methodological devices in risk landscapes. Especially, in opposition to the mainstream planning, Messina (2006) proposes what he has defined an "indie planning" based on three main ecological actions strictly intertwined to each other's, that are:

- 1) To complexify: that entails to overcome the disciplinary borders in order to redefine the cognitive methods. The planning needs osmotic border that enable the exchange between disciplines and, above all, with the local knowledge, real indigenous source of territorial culture (Longo 2008);
- 2) Co-implicate that has to do with the involvement at all levels of all actors. The planner is not an outsider and professional practitioner working from faraway, instead is an insider, a person who cross the territory, absorbs it, know it, experiences it and tells about it (Sandercock 2004)
- 3) To narrate that creates new moments of meeting and communication with local communities so to go beyond the scientific formalism and the expert language, instead, opening to new forms of meeting, dialogues, and action with inhabitants (Messina 2005, 2006).

The proposed indie approach treats the industrial risk as a "ecosystemic territorial landscapes phenomena" (Gravagno and Messina 2008: 17) and the stories of landscapes (Gravagno 2008) as fundamental tools to intercept the inner and perceptive dimension of the landscapes, but also put emphasis on those ecological communities' practices that make/give shape the landscapes. Messina and Gravagno (2008) furthermore demonstrate that stories are able to/appropriate to map the diffused damages in addition to the punctual ones that can be easily identified. This perspective on the perception of risk is rooted in the sociocultural interpretation according to which the environment and culture are contingent, rather than distinct and separate (Kondo et al. 2014). It follows that risk perception is never a purely intellectual process, about reception of knowledge per se, but is socially and culturally constructed, rooted in every-day direct sensory and bodily experience, social relationships and interpersonal interaction and conversation (Wakefield et al. 2001; Wynne 1992). Bickerstaff and Walker (2001) call this the "localisation" of people's understandings of environmental risk within the immediate physical, social and cultural landscape.

I think that there are a few commonalities, if maintaining difference, between the "indie approach" and a strand of planning that has borrowed from social science some qualitative tools, such as questionnaires' and interview, in order to unpack and investigate the public risk acceptance in terms of a delicate balance of costs, benefits, and trust (Verbeek 2020). Despite using similar tools in respect to the ones applied by Salvo Messina and Gravagno (2008), the final purposes of these two are quite different. Thomas Verbeek advocates for a socio-cultural perspective as an alternative for the psychometric paradigm. He applied the combination of a community survey with qualitative interviews in a comparative study of two petrochemical communities. He makes the point that a residents' survey can still be useful when applying a socio-cultural risk perspective, if the survey is carried out and interpreted at community level, not at individual or society level. The

psychometric paradigm -according to which the psychological perspective on public risk perception addresses the cognitive and attitudinal processes through which risks are interpreted and represented at the individual level- uses such tools with the specific purpose to outline to which extent people adapt to live daily close to a petrochemical complex. Diversely, Filippo Gravagno and Salvo Messina (2008) seek to use them as knowledge tools that may help to trace an alternative story of risk landscapes. The former mainly ground on the idea of conflict between experts and lay people, or between objective and statistical risk on the one hand, and subjective or perceived risk on the other, as a consequence of which the different public perceptions of environmental and industrial risk, sometimes leading to protests, criticism, or resistance in the public sphere, is seen as a pure problem of information and public ignorance, which could be solved by effective risk communication (Bickerstaff 2004). According to the communication thesis, explaining scientific and technical information effectively would bring citizens' ideas about risk closer to the experts' ideas (Tesh 1999). This is why there has been an increasing number of public opinion surveys on risk perception from the 1960s onwards. In these psychometric-grounded studies, the use of tools such as questionnaires and public audit, while crucial to collect and understand the perception of risk by locals, is not intentionally applied with the final purpose of collectively constructing knowledge about risk, nor to use that knowledge to emancipate and empower population's requests.

Similarly, other works examine the perceptions and coping strategies can be found, for instance, in the Aamjiwnaang First Nation, which is surrounded by 'Chemical Valley', the largest complex of petrochemical plants in Canada. Analysis of in-depth interviews showed that residents perceive 'Mother Earth to be sick'; however, a strong level of community cohesion prevails, with 'place' as a significant anchor to the culture and history of the community. Residents articulated a collective sense of responsibility for the well-being of members both within and surrounding the community, whereby some residents would never leave, regardless of the toxic environment and concern for high rates of cancer and respiratory diseases among both adults and children. Residents employed action-focused coping strategies such as 'indoor evacuation' and the 'Cop-sniff test', and emotional coping strategies including blocking out the effects of 'Chemical Valley' by frequently ignoring warning sirens from industry. The results of these research in contaminated contexts call on the need for a collaborative environmental planning intervention involving clear community participation (Luginaah et al. 2010).

In my eyes, the theory of complexity and its repercussion within the planning field has brought a revolutionary watershed both in the manner in which environmental issues have been conceived as wicked problems and, in the effort, to envision an ecology of planning that is able to catch such complexities, i.e. such interrelation between the ecology of mind, nature and collectivity. The ecology of planning is based on the art of the relations according to which the landscape itself is a relational field, the fruits of the interaction between the planners and the other actors, human and not, shaping the landscapes. Such approach to the landscapes as a place of the peoples' perspective has entailed an increasing interest in the stories of landscapes through the lens

of citizens. While I agree that the search for the relationships underpinning and shaping over the time the landscapes is crucial for understanding the transformations over the time, as well as results crucial for identifying the diffused damages in case of industrial risk landscapes as demonstrated by Salvo Messina and Filippo Gravagno, however I found a shortfall in approaching the more than human worlds. If the relational planning is indisputably apt to give voice to marginalized and fenceline communities by unfolding and bringing light to the situated local perspective and knowledge of who live territories, what about all those non-more-than human communities living and also shaping those same landscapes as well as suffering and being affected whereby contamination and pollution occurs? In other words, is it possible to come upon/observe the legacy of the deep ecology, integral ecology, the interspecies justice and kincentricity discourse calling for an eco-centrism based on “kinnes” with all the critters and plants, fungus and bacteria etc. living, nurturing and generating our environment? If yes, how has this impacted or may impact the planning and the planning of risk landscapes? I seek to further unfold these open questions in the last section of this chapter regarding the search for concrete application of multispecies justice into the planning theories and practices.

A more just planning for a more-than-human world

Within the environmental justice movements, relatively recent work has pointed up how the interplay between ecological and environmental justice (Schlosberg 2007) are needed so to expand the critical researches towards a temporal and historical multiscale analysis able to include the interspecies (in)justice (Pellow 2016, 2018). All these visions, though with multi-nuanced interpretations, I think have the common thread to be “revolutionary” to the extent they intentionally question the agency and (micro-macro) power relationships involving the non-more-the human community at stake³⁶. While the environment and nature has been always central in the reflections and works of planners, at the closest glance it emerges how this has occurred by considering them as something mostly stationary, lifeless, and “agencyless”. If Brenner et al (2009: 195) called the attention to “Cities for people, not for profit” – with the above line of reasoning in mind – is it really so self-evident that cities should only be for ‘people’? Reduced to what Giorgio Agamben (1998) has defined “bare life”, nonhumans are not included in planning policies or deliberative processes as political subjects (Metzger 2015a, 2015b). This happens because urban planning has a history of viewing cities as somehow separate from nature (Byrne et al. 2014; Metzger 2015a, 2015b). This comes from understanding the urban in a human exceptionalism manner: regarding cities as the sole domain of humans, constructed out of the ‘raw materials’ of nature (Wolch 2002), and failing to see how humans and nonhumans co-construct and cohabit

³⁶ In chapter 1.4 I will dedicate a section to unravel the different declinations of the concept of Anthropocene, including Chtulucene, Planteocene and so on. In the same chapter, I will talk about the development of the environmental movements over the time, including the deep ecology and the integral ecology, respecting calling for a shift of paradigm through an eco-centrism and spiritual (religious!) guardianship of all critters in the earth.

urban life-worlds (Byrne and Wolch 2009). Decentering human exceptionalism and imagining the alternatives, and how to practically affect and modify the mainstream planning through these alternatives, is the challenge.

By going through the most recent literature, only a few papers and publications can be found handling this theme. In fact, representing a pretty small reflection of niches in comparison to, after all is said and done, the quite substantial scientific production concerning the techno-driven resolution of risk, the management of uncertainties, the resilience, the justice topic and the relational planning.

Metzger (2015a: 16) provides a clue, observing that “myriads of creatures and existences are speaking to us all the time” and that “humans have a responsibility to listen properly to their voices” (Despret 2005). For planners, such listening requires “fashioning the space, manner and language to experiment with ways of being- [or becoming-] together where the human is not the centre of activity or meaning-making” (Lestel et al. 2014: 126).

Exploring possible resources that could serve to institutionalize such a more-than-human sensibility into an everyday practice of urban planning, which still today can be described as a ‘tightly woven modernist fabric’ (Metzger 2016). In his reflection, Metzger calls for engendering new modes of more- and other-than-human consultations in the form of new technologies of mutual affectation, in turn producing new material-semiotic circuits of communication that facilitate a learning to both affect and become affected in new ways (Metzger 2016: 591)

The lack of respect for, or even recognition of the other-than-human denizens of cities is an ongoing affair which is unfortunately also reproduced in and through the mainstream of contemporary urban planning theory (although there exist notable exceptions to this, see e.g. Wolch 2002; Metzger 2015a, 2015b, 2019)

According to Metzger (2015a, 2015b), the planning urgently needs to develop methods that enable planning processes to function as arenas that may contribute to engendering a new relationship to the world, and through which we hopefully might find ways to begin to deal with how we, as a species, have always been more-than-human.

However, despite providing several critical and insightful clues, Metzger does not address how practically to do this, neither provide some more specific indications. An attempt to remedy these methodological gaps comes from a quite experimental research groups on the multispecies geographies lead by Donna Houston at the Macquarie School of Social Sciences in Sidney that explores innovative and just responses to global heating and environmental change. They conduct engaged social research that contributes to more ethical and equitable multispecies societies in relation to food, forests and cities. More in details, Houston and her collaborators (Houston et al.2018: 191) argue that the radical planning, while it has challenged the European and masculine subject of planning knowledge, it has not yet substantively challenged the ontological exceptionalism of humanism in planning, for this reason, planning theory requires radical rethinking of its modes of (post)humanistic value in the Anthropocene. In their work, they consider the question of human identities and

responsibilities within multispecies communities in relation to how planning theory might better respond to the social, ecological and ethical challenges posed by the Anthropocene.

Houston's work critically explores how planning theory might develop inclusive, ethical relationships that can nurture possibilities for multispecies flourishing in diverse urban futures, the futures that are increasingly recognized as co-produced by nonhuman agents in the context of climate variability and change. We identify two fruitful directions for planning theory to better engage with the imbricated nature of humans and nonhumans is recognized as characteristic of the Anthropocene – multispecies entanglements and becoming-world.

The ecologically connected thinking extends the ethics of urban experiences, focusing on how animals and plants in the city relies on bodily encounters (the visibility of wanted or unwanted nonhuman others). Entanglement is a mode of ethical urban encounter that 'extends ethics beyond the body and out into the shared multispecies worlds' (Wright 2014). Nonetheless, nurturing multispecies relationships are also about what we cannot see: micro and non-individuated organ-isms, nonhumans who may not even know exist (Wright 2014). According to Houston et al. (2018), for planning theory and practice to further develop inclusive and ethical relationships that can nurture possibilities for flourishing urban futures in the Anthropocene, they need to engage with imbricated nature–society relations and multi-scalar and temporal conditions inherent in urban ecologies. Wright (2014) sustains that 'responding ethically and responsibly from this position demands an acceptance of entanglement without idealization or despair'.

Houston then recognizes two key questions for planners, that are (1) how multispecies relationships can be ethically and politically considerable in spatial land use planning decisions and (2) how socially and environmentally just planning can meaningfully engage nonhumans in deliberative practice without reducing nonhumans to objects or symbols of urban political struggle (Metzger 2014; Byrne 2011).

Urban planners and scholars need to think carefully and critically about who speaks for the nonhuman in city and place making, and about whether and how the nonhuman might speak for themselves. In some areas of scholarship at least, "the very cry of the nonhuman" (Johnston 2008: 636) is gradually finding voice.

Donna Haraway's (2008) concept of becoming-with emphasizes the importance of human responsibilities in our relationships with companion animals, later broadened to imply 'critters of all kinds' (Haraway 2010: 54). The notion of becoming-with is grounded in connectivity and encounter rather than in difference and separation: "becoming is always becoming with, in a contact zone where the outcome, where who is in the world, is at stake" (Haraway 2008: 244). Houston and colleagues (2018) advocate a process of becoming open to the capacity of all nonhumans bu turning to the notion of 'becoming-world' (Braidotti

2013)³⁷ to recognise with respect the role of nonhumans as active, responsive participants, ‘making kin’ (Haraway 2015) in planning-related encounters, in which humans would yield their position of dominance. A multispecies and multi-thing becoming-with – becoming-world or worlding – renders planners open to ethical, perhaps grace-full encounters with more-than-human assemblages.

This line of thinking raises three critical challenges of planners:

- 1) Are planners prepared for the following?. Abandon the traditional idea that political rights, entitlements and deserts only apply to people;
- 2) Confront the very real problem of defining political subjects in a world where the boundaries between humans and nonhumans are hard to discern and arguably tenuous;
- 3) Expand political reasoning to include nonhumans, without resorting to the idea that the latter exist ‘in themselves’ (Castree 2003: 207; Metzger 2014: 208).

In order to critically rethink the city–nature nexus if planning theory (and in turn practice) are to develop and expand an idea of the ‘good city’ that is materially just and climate-adaptive, Houston and colleagues (Houston et al. 2018) suggest that "planners make kin, not cities!".

While I found this debate on how to deepen planning theory’s engagement with more-than-human thinking illuminating on the need to expand the sphere of interest, reflections and actions of the planning theory and practices toward a just multi-species approach, I identify a few critical points that may need further developments.

One consideration regards the maturity of the multi-species proposals. Being at the dawn of the discussion, actually there are, so far, relatively few contributions to this sector of planning that is a niche one. It has not yet given birth to a real and concrete methodological proposal, while it has kept a mostly theoretical and epistemological level of debate that, despite remarkable, does not furnish any “recipe” to experiment with in the reality of the planning practice. This thesis, how I will better explain in chapter 1.5 and chapter 2 seeks, among the other goals, to suggest a possible methodological direction to be applied in order to better read, comprehend, and involve the entanglement of non-human communities into the insurgent knowledge and planning practices, through what I named a “small slow street approach” making use of small data.

³⁷ Braidotti (2006: 154) explains that “to become enmeshed and interconnected into with the nonhumans, rather than integrating them into our worlds, would entail fusion between the self and his/her habitat: replacement of the self by ‘a living nexus of multiple inter-connections’ and alliances that empower the collective”.

However, if this tartness can be compensated through the future further advancements put in action by desirable experimental projects, the another point I want to rise touches a more ethical positioning in relation to the advocacy and power relations. As a matter of facts, while the motto “we speak for ourselves” has stimulated a quite intense discussion on how to give voice to the subaltern in a way that the auto-narrative itself can represent a political and empowerment moments that may entail popular education (Freire 2005; Dolci 1974) and quest for justice, the position to assume towards non-human communities is, in my perspective, even more complicate and brings in values and ethics. Just to better explain what I mean, while according to the integral ecology the human are the guardianship of the earth and for this reason is their duty to take care of what god has created (see for instance the encyclical *Laudato Sì* in Bergoglio 2018), the position of kincentric theory call for practice of care because humans are relative -brothers, sisters and siblings, toward the nature and the ecosystem, “relative with reciprocal obligations” (Whyte 2018: 131), this implies that the soil and water are not only alive but are part of the same family. This latter kinship approach, in turn, has different roots than the ecocentrism of deep ecology mainly based on biological scientific argumentation. As a consequence, not only it is not findable in literature a complete and clear indication on how to practically involve the non-human communities into the planning practices, but also the way and vision behind this possible future proposals will be even more complicated by the ethical-value leading the planners and the planning tools and normative, This lack is, in my view, even more promising if we look at the slow burning issue and violence provoking diffuse and slow disaster in which precisely the modification on the more-than human communities are small telltale of big dramatic transformations.

In this regard, the interspecies justice discourse into planning seems to me still lacking in relation to slow disaster and diffused damages in risk landscapes due to industrial contamination. How to construct knowledge about this territory by achieving also interspecies justice?

I think that we should mobilize the concept of slow everyday disasters interconnected with the form of slow violence and understand how the more-than-human communities may support the construction of knowledge being able to achieve more multi-species justice and to orient planners towards a more just socio-ecological sustainable planning.

Final remarks

In this chapter I attempted to critically review how the planning discipline has dealt with the environmental risk issues over the time until nowadays. If from the previous chapter it has emerged a rich and groundbreaking flourish of ways of constructing risk knowledge (chapter 1.1), it does not appear the same for planning. However, instead of throwing the baby out with the bathwater, I do believe that from the planning field some critical and insightful consideration can be deduced and can help to understand how to improve the planning of risk landscapes.

I have explained how planning is historically a child of the rationalism approach that, by applying positivist scientific methods to the planning issues, has sought objective and top-down choice. This legacy can be found in the way mainstream planning has tackled (and it is still tackling) the uncertainties of our risk society by borrowing from other risk fields, such the earthquake risk management, the separation of the risk in vulnerability, dangers, and exposition. By reckoning more and more on progress and technological advancement, some sections of urban planning, from modernist, have become increasingly techno-driven and uses the label of "smart city" to blur any critique. They represent a sort of follow-up of the ecological modernization theory. Albeit the techno-driven approach has been resolute in facing many burning issues over time, however it is unable to catch the social injustice issues, the complex relationship between human-society-environment and how these relationships have changed. Furthermore, it is not appropriate for slow burning issues occurring in diffuse ways in time and space plus it is not able to deeply intercept and unpack the injustice and power relationships that subtended the environmental risk. The smart-driven solutions were not the only ones enforced by the planning, indeed, other scholars have maintained how more resilience may be an answer to the current uncertainties, while another family of studies points at the nature-based solution as a way to mitigate environmental risk in city, much less than a way to achieve more justice: this latter a strand of inquiry that has been recognized how in need of further theoretical and empirical works (Cousins 2021). Interestingly within the planning, the topic of environmental risk has been poorly intertwined with the one of social justice. While the theorization of justice is the core of a vivid debate among planners, how to convert these abstract developments into practical changes in our city aimed at obtaining in the meanwhile more social and environmental justice is still a mostly unexplored field. In fact, the topic of justice has been mainly treated in procedural and deliberative terms, i.e. in connection with the participatory strand of planning sustaining that a larger participation already implies more justice and being mirrored in the elaboration of different innovative types of planning (e.g. communicative, transactive, collaborative, etc.) having each its own peculiarities. Another effort can be seen in "the just city" concepts that, however, mostly embrace a neo-institutional vision, how to reach which is not clear in practical terms, especially in all those places characterized by weak institutions, of which Gela is a quite emblematic example. Differently, another strand dealing with justice in terms of social equity and recognition comes from the radical planning and insurgent planning practices that, however, have relatively given small space to environmental justice issues, to environmental risk and risk knowledge, i.e. on how to move from the insurgent planning knowledge to planning transformative practices. Agyeman has been the one who stubbornly has tried to merge the environmental justice discourse into the planning for sustainability by envisioning the bridging and overarching concept of just sustainabilities. Although Agyeman has used his theoretical concepts to interpret and analyse concrete urban experience, a real call for a spatial turn in seeking for justice can be found in Soja's work. However, to really reach an approach to risk as a landscape territorial phenomenon, another strand of literature may provide some enlightening insights, i.e. the relational planning and territorialist approach dealing with territory and landscapes as a relational field in which all components play a creative role of a collective dance. Stemming from this cultural

cradle, a very inspiring work comes from Salvo Messina and Filippo Gravagno analysis of industrial risk landscapes.

While I acknowledge that Messina and Gravagno's work (2008) represent the starting point of my research, and therefore a crucial background of this research, I recognize a few points in their groundbreaking research that have not been sufficiently explored, but that I attempt to deepen more through my Ph.D. thesis. In particular, in their research, while they are able to emphasize the human dimension of knowledge, they dedicate much less attention to the more than human communities. This has pushed me forward further comparative literature review on how planning is dealing with the groundbreaking reflections on multispecies justice. Whereas some theoretical efforts can be recognized into niches of innovative and undisciplined planners, a more concrete and methodological development is still missing, as well as a more in-depth analysis of the ethical implications.

In short, all these opportunities and gaps in the way the planning field deals with the construction of risk knowledge and through which I went in this chapter, make up the starting point of the problem statement I detected and that I will present in chapter 1.5.

Finally, all these gaps and opportunities also find both reflections and contradictions into the main laws and normative dealing with risk, to which I will dedicate the next chapter.

1.3. The gaps and challenges in the institutional regulations on risk landscapes

My aim in this section is to examine and compare some relevant laws regarding risk landscapes, and in particular industrial risk landscapes. By doing so, I seek to illuminate how the current regulatory tools treat the construction of risk knowledge and the socio-environmental (in)justice in facing the industrial risk landscapes both at the international, European, Italian, regional and local levels.

Risk Knowledge and Socio-Environmental (In)justice: International level

In the previous chapter 1.3. I addressed the origins that historically underlie the modernist approach to spatial planning and that permeate the modernist trends, whose later expression is the recent rhetoric on smart city and big data as a way to deal with upcoming risks. One of the primary operative objectives and achievements of mainstream planning is to convert visions and values into legislative frameworks of planning or at least to shape the legislation in light of such visions and values. According to Leonie Sandercock (2003a), “the planning system unreflectively expresses the norms of the culturally dominant majority”, including the norms of how that majority likes to use space. Despite my belief is that in emphasizing planning as a regulatory or disciplinary practice, its possibilities of transformation which may in turn be connected to histories of resistance to specific planning practices and regulatory regimes" (Sandercock 2003a: 40), however, I maintain that precisely because the normative is a mirror of a system of values and epistemologies, its critical analysis may dig up the cultural constraints, the structural injustices, and value-led influences hidden into the current planning laws, as well as the potential points for further future developments. After all, planning policies are neither gender-neutral nor race-neutral or class-neutral with respect to minority and powerless communities. They are therefore all but neutral (Sandercock 2003a).

Not only radical planners (cap. 1.2.), political ecology, environmental humanities, and environmental justice studies scholars (cap. 1.4) have treated the risk as something intrinsically interrelated to socio-economic inequalities, but also a series of declarations and official protocols have attempted to democratize the process of construction of knowledge to achieve social justice. For instance, the following international documents I will address: the Sustainable Development Goals (SDGs) and the Sendai Framework, as well as other European documents, such as the Parma and Ostrava Declarations, and the Aarhus Convention, and a few national, regional and local normative frameworks. My aim is not to give an exhaustive analysis of all these documents, but to look over them in order to reveal their lacking points in relation to the construction of knowledge in risk landscapes.

The SDGs - set up in 2015 by the United Nations General Assembly and called also Agenda 2030 since those goals should be achieved by 2030- are a collection of 17 interlinked global goals designed to be a "blueprint to achieve a better and more sustainable future for all" (UN 2017). What has been declared as a novelty of SDGs is that they specifically pay attention to multiple intersectional issues, like gender equity, education, and

culture. Nevertheless, while it is true that the SDGs touch many points, they do not intersect these latter to each other. For instance, goal 10 "Reduce inequality within and among countries" speaks about inequalities without explicitly referring to the interconnection between social and environmental inequalities, in terms of access to livelihood resources and maldistribution of burdens of the industrial development, neither to the socio-ecological injustices caused by the globalization of the monopoly of corporations. Such links are present in other famous documents, such as the "principles of environmental justice"³⁸. Another questionable point can be seen in goal 11 "Make cities inclusive, safe, resilient and sustainable" that indicates as targets affordable and sustainable transport systems, inclusive and sustainable urbanization, protection of the world's cultural and natural heritage, and reduction of the adverse effects of natural disasters and of the environmental impacts of cities, yet does not mention all those places and landscapes that have been already profoundly corrupted and damaged from a social, economic, cultural, and environmental point of view from our current risk society, or better, treadmill of production. After all, how goal 8 "Promote inclusive and sustainable economic growth, employment and decent work for all" emblematically tells, the current growth-driven economic system is not questioned nor doubted. In other words, this goal states that a sustainable future cannot occur without constant economic growth, in line with an idea of green capitalism based on incontrovertible economic growth as the only possible path. This view rejects discussion of alternative views demanding, for example, global ecocalism (Fischer 2017) or degrowth (Liegey and Nelson 2020; Kallis et al. 2020). It is also worth considering that if goal 13 "Take urgent action to combat climate change and its impacts" stresses the emergency of acting, it does so mainly referring to climate change measures into national policies, strategies, and planning, almost failing to recognize all the long battles at the basis of countless environmental conflicts over time (Martínez Alier 2009 [2004]) until the most recent worldwide Fridays for Future. Similarly, goal 16 "Promote just, peaceful and inclusive societies" mostly applies the word "justice" in a procedural way rather than substantive, by delegating the resolution of injustices to institutions and courts of justice, while depicting the crimes and violence only in terms of manifest phenomenon carried out by illegal criminals, while allowing the ecological violence and injustice afflicted by both the State and legal subjects in silent, slow and invisible manners (Nixon 2011).

After all this international document, despite being presented as innovative, was built and spread by a relatively small group of powerful actors that have been committed to list targets and indicators for each of the 17 SDGs and to realize a book for each goal³⁹ aimed to help people to understand the Sustainable Development Goals

³⁸ https://www.ucc.org/what-we-do/justice-local-church-ministries/justice/faithful-action-ministries/environmental-justice/principles_of_environmental_justice/

³⁹ In order to attempt a "localization of this global goals" the co-chairs of the SDG negotiations each produced a book to help people to understand the Sustainable Development Goals and how they evolved. The books are: "Negotiating the Sustainable Development Goals: A transformational agenda for an insecure world" by Ambassador David Donoghue, Felix Dodds and Jimena Leiva and "Transforming Multilateral Diplomacy: The Inside Story of the Sustainable Development Goals" by Macharia Kamau, David O'Connor and Pamela Chasek.

and how they evolved. In other words, the content defects of such document well reflect the shortcomings underlying its procedure of construction still mostly relying on top-down expert-driven policy making process⁴⁰.

Another international document that, unlike the SDGs, focuses more explicitly on the risk topics is the Sendai Framework for Disaster Risk Reduction 2015-2030. Adopted by the United Nations member states in March 2015 at the World Conference on Disaster Risk Reduction held in Sendai, Japan, and endorsed by the UN General Assembly in June 2015, the Sendai Framework has the merit of trying to embrace a more complex and multi-perspective approach to risk which was. It is the successor agreement to the Hyogo Framework for Action (2005–2015), which had been the most encompassing international accord to date on disaster risk reduction.

The Sendai Framework sets four specific priorities for action that are: understanding disaster risk; strengthening disaster risk governance to manage disaster risk; investing in disaster risk reduction for resilience; enhancing disaster preparedness for effective response, and "Building Back Better" in recovery, rehabilitation, and reconstruction.

What is relevant about this international document is how it prominently patently tends to bridge the resolution of risk with the importance of local knowledge of most marginalized communities.

Consistent with principle n. 10 of the Rio de Janeiro Declaration (1992), proclaiming “the right of citizens to access environmental information held by public authorities”, and with the Aarhus Convention (1998), stating the crucial role of public participation and access to justice in environmental matters, the Sendai framework conceives risk as a multidimensional issue whose reduction is inseparable from the implementation of democratic processes designed to evaluate and manage it.

The Sendai Framework promotes an approach to risk, based on inclusive decision-making processes and governance, on open and accessible data systems. In particular, according to its guidelines (UN Office for Disaster Risk Reduction 2015: 13), disaster risk reduction requires a multi-hazard approach and inclusive risk-informed decision-making based on the open exchange and dissemination of disaggregated data, including by sex, age, and disability, as well as on easily accessible, up-to-date, comprehensible science-based, non-sensitive risk information, complemented by traditional knowledge. More information is hence achievable by promoting real-time access to reliable data, making use of space and in situ information such as geographic information systems (GIS), and using information and communications technology innovations to enhance

⁴⁰ SDGS are in line with a long series of official documents. For instance, the awareness about "The Limits to Growth" (Meadows, 1972) has been implemented by means of the introduction of the sustainable development concept (Our Common Future, 1987), as well as, by mean of the organization of several conferences, summits and meetings (Stockholm 1972, Rio De Janeiro 1992, Johannesburg 2002 etc.), the signing of agreements (Maastricht 1992), of protocols (Kyoto 1997), and of action-programs (Agenda 21, Agenda 2030).

measurement tools and the collection, analysis and dissemination of data. Importantly, the Sendai Framework states the cruciality of ensuring the use of traditional, local and indigenous knowledge and practices in order to integrate them with scientific knowledge into risk assessment and to develop and implement strategies, plans, and programs, adapted to the local context (UN Office for Disaster Risk Reduction 2015: 15). Integrating subaltern knowledges can be possible by enhancing collaboration among people at the local level to disseminate disaster risk information through the involvement of community-based organizations and non-governmental organizations (UN Office for Disaster Risk Reduction 2015: 15). To this end, one of the goals of the Sendai Framework is empowering local authorities, as appropriate, through regulatory and financial means to work and coordinate with civil society, communities, indigenous peoples, and migrants in disaster risk management at the local level (UN Office for Disaster Risk Reduction 2015: 18). The Sendai Framework states that while States have the overall responsibility for reducing disaster risk, it is still a shared responsibility between Governments and relevant stakeholders. In particular, non-State stakeholders play an important role as enablers in providing support to States for disaster reduction, in accordance with national policies, laws, and regulations, in the implementation of the Sendai Framework at local, national, regional, and global levels. Non-State stakeholders' commitment, goodwill, knowledge, experience, and resources will be needed (UN Office for Disaster Risk Reduction 2015: 23). The Sendai Framework underscores that the promotion of risk knowledge requires both the involvement and partnership of all social partners, including the most affected and the most marginalized subjects, such as women, children and youth, persons with disabilities, migrants, volunteers, the community of practitioners, and older persons who should be involved into a process of empowerment.

To sum up, the Sendai Framework supports a multi-sector and multi-dimension risk and therefore strives towards a holistic approach to risk assessment, which is considered inseparable from the enhancement of democratic processes designed to evaluate and manage it.

In my opinion, the SF well concentrates the need to extend, to complexify, and to redefine the concept of risk.

The Sendai Framework reflects in "directives and formal terms" the rich debate on the importance of taking into consideration the local knowledge, the plurality of stakeholders, including the most vulnerable ones, in the process of construction of knowledge aimed at decision-making. Notwithstanding, a few drawbacks can be underscored. For instance, despite the consideration toward local communities and fragile sectors of society, the relationship between experts and lay people still reproduces a hierarchical relationship in which experts inform and empower subaltern populations and provide them the opportunity to be listened to by experts.

Another theme concerns the type of risk. Although the Sendai Framework may be seen as an encompassing document pertinent to risk, it mostly deals with disaster risk reduction connected with natural and often sudden hazards. The Sendai Framework has the merit of having dedicated attention to the involvement of stakeholders (including the most vulnerable ones) regardless of the type of risk at stake. Nevertheless, the specific type of risk that occurs due to the industrial impact and that transforms landscapes gradually over time and in a spread

way over space, has some peculiarities that cannot be found in any part of the Sendai Framework. More discussion on industrial risk can be found in European and Italian laws that I will present and critically examine in the following sections.

Risk Knowledge and Socio-Environmental (In)justice: European level⁴¹

As I have unfolded in chap. 1.1., although it is true that according to the so-called "boomerang effect" (Beck 1992: 37) no one is exempt from the risk of society, regardless of social class, gender, ethnicity, or geographical location, it is also true that it cannot be said the same about the ability and possibility to avoid the risk or to at least mitigate it, as this possibility depends largely on the knowledge and accessible information that people have about risk. The disadvantaged sections of society may have fewer economic and sometimes cultural instruments to deal with risk, it follows that risk is inherently linked to the socio-economic disparities that impregnate the social context. While the academic North American debate mainly highlights the racial dimension of such inequalities of exclusion and environmental discriminations, as the constitution of EPA-Environmental Protection Agency and its specific programs on environmental justice confirms, the European debate mostly focuses on the causes provoking injustices. In particular, I will scrutinize and compare some main documents dealing with environmental risk through examining how these normatives, documents, protocols embrace or neglect the relevance of co-constructing knowledge to address health and environmental justice underlying risk.

The conception of risk as interconnected with health issues is prevalent in two main European documents, the Parma (WHO 2010a, 2010b) and the Ostrava Declaration (WHO 2017). While at the international level the SF tackles the implementation of risk management by the democratisation of the decision-making process, at the European level those other two documents, the Parma (WHO 2010a, 2010b) and the Ostrava Declaration (WHO 2017) are Ministerial Conference on Environment and Health that focus more on the effects of social and gender inequalities of environmental health risks.

In more detail, the Parma Declaration on Environment and Health demands the State's commitment to taking measures to reduce social and gender inequalities in health risks by promoting local actions and ensuring active participation in the European Environment and Health Process. The background document prepared for the Parma Declaration (WHO 2010a, 2010b) indicates that inequalities are a major challenge for environmental health policies, and confirms that people living in adverse socioeconomic conditions in Europe can suffer twice

⁴¹ It is worth noting a difference between Environmental Protection Agency (EPA), which is an independent executive agency of the United States federal government tasked with environmental protection matters, and the European Environment Agency (EEA) which is an EU agency tasked with providing sound, independent information on the environment. It operates as a major information source for those involved in developing, adopting, implementing and evaluating environmental policy, and also the general public.

as much from multiple and cumulative environmental exposures as their wealthier neighbors, or even more. Similarly, inequalities in exposure to environmental threats have been identified for vulnerable groups such as children and elderly people, low-education households, unemployed persons, and migrants and ethnic groups (WHO 2010b). This document adds important information regarding social inequalities in health risk related to ambient air quality, housing and residential location, unintentional injuries among children, working environment and work-related health risks, environmental justice in waste management and wealth, and global climate change. The signatories of the Declaration of Parma committed to ensuring public health by improving access to safe water and sanitation addressing obesity and injuries through safe environments, physical activity and healthy diet; Preventing disease through improved outdoor and indoor air quality; preventing disease arising from chemical, biological and physical environments.

The Ostrava Declaration was signed/endorsed at the end of the Sixth Ministerial Conference on Environment and Health which took place in Ostrava, Czech Republic, 13-15 June 2017. This document aims to guide the governments of European countries to take steps to improve the environment and the health of the population. The Ostrava Declaration summarizes the priorities in this area in the WHO European Region. It provides tools to the Member States to develop national portfolios for action, and introduces new institutional arrangements for the European Environment and Health Process that should address the need to accelerate progress on health and environment, with particular reference to the environment-related health goals and targets of the 2030 Sustainable Development Agenda. It includes actions on “strengthening adaptive capacity and resilience to health risks related to climate change and supporting measures to mitigate climate change and achieve health co-benefits in line with the Paris Agreement”. The Declaration of Ostrava (WHO 2017) claims that people living in adverse socio-economic conditions in Europe can suffer twice as much as their wealthier neighbors, if not more, from multiple environmental exposures.

The Ostrava Declaration contains 18 points summarizing the starting situation, describing the policy objectives, tools and mechanisms to achieve the above. The section dealing with specific issues affecting the quality of life of citizens includes seven major objectives for improving the environment, health and sustainable development:

- Improving indoor and outdoor air quality for all, as one of the most important environmental risk factors in the Region, through actions to meet the values of the WHO air quality guidelines in a continuous process of improvement.

- Ensuring universal, equitable and sustainable access to safe drinking-water, sanitation and hygiene for all and in all settings, while promoting integrated management of water resources and reuse of safely treated wastewater, where appropriate.

- Minimizing the adverse effects of chemicals on human health and the environment by: replacing hazardous chemicals with safer alternatives, including non-chemical ones; reducing the exposure of vulnerable groups to hazardous chemicals, particularly during the early stages of human development; strengthening capacities for

risk assessment and research to secure a better understanding of human exposure to chemicals and the associated burden of disease; and applying the precautionary principle where appropriate.

-Preventing and eliminating the adverse environmental and health effects, costs and inequalities related to waste management and contaminated sites. by taking steps towards the elimination of uncontrolled and illegal waste disposal and trafficking. Instead, promoting the sound management of waste and contaminated sites in the context of transition to a circular economy.

-Strengthening adaptive capacity and resilience to health risks related to climate change, supporting measures to mitigate climate change, and achieving health co-benefits in line with the Paris Agreement.

-Supporting the efforts of European cities and regions to become more healthy, inclusive, safe, resilient and sustainable through an integrated, smart and health-conscious approach to urban and spatial planning, mobility management, the implementation of effective and coherent policies across multiple levels of governance, stronger accountability mechanisms and the exchange of experience and best practices in line with the shared vision established by the New Urban Agenda.

-Building the environmental sustainability of health systems and reducing their environmental impacts through such means as efficiency in the use of energy and resources, sound management of medical products and chemicals throughout their life-cycle and reduced pollution through safely managed waste and wastewater, without impacting the sanitary mission of health services.

Ostrava Declaration thus identified seven priority issues for public health among which contaminated sites appeared for the first time. WHO European Centre for Environment and Health (WHO 2013: V) has defined contaminated sites as the “result of earlier industrialization and poor environmental management practices. Past and current activities can cause local and diffuse accumulation of environmental stressors to an extent that might threaten human health and the environment, by altering air quality, hampering soil functions, and polluting groundwater and surface water”. The European Industrially Contaminated Sites and Health Network (ICSHNet) adopted an operational definition of industrially contaminated sites that focuses on the actual or potential risk for human health: “areas hosting or having hosted industrial human activities which have produced or might produce, directly or indirectly (waste disposals), chemical contamination of soil, surface or groundwater, air, food-chain, resulting or being able to result in human health impacts” (Iavarone and Pasetto 2018). The main target populations are communities residing close to contaminated areas, which are “hot spots” of local pollution and can affect all environmental media including air, water and the food-chain.

The WHO European Centre for Environment and Health has proposed a European network on contaminated sites and health – to bring together experts and institutions with common interests and duties on this topic – and provided information and advice on the health impact of contaminated sites and their remediation. Among the topics and goals that have been identified, there are: producing guidelines on strategies for studying environment and health in contaminated sites, focusing on methodology and communication strategies,

implementing health assessments that include the separate analysis of population subgroups – in particular, children, and planning a system to collect data and produce comparative analyses of the health impact of different sources of contamination within and among different countries of the WHO European Region, allowing for the inclusion of socio-economic factors (WHO 2013: VI).

Both Parma and Ostrava declarations have the merit of explicitly tackling the theme of environmental risk as intertwined with health issues and socio-economic differences and bringing these links -already established in the US- in the European context where this is still a growing discourse.

If the possibility to mitigate environmental and health risk effects depends largely on socio-economic status and accessible knowledge, therefore, as the aforementioned documents affirm, to deal with risk means to deal with socio-economic justice.

Although these are without doubt valuable documents for the European academic debate, public policies, and vulnerable people's recognition, at the same time they lack exhaustive attention to the topic of risk knowledge and to causes and effects in industrial risk landscapes. A few references in the documents are found about how the WHO European Region is littered with active and abandoned waste and industrially contaminated sites. Since the management, treatment, and disposal of solid and hazardous wastes cannot be achieved without a marked environmental impact, special consideration needs to be given to abandoned or development sites. How the power asymmetries produce socio-environmental and health injustice as well as how to democratize the construction of risk knowledge are all topics almost unexplored within these documents.

The entity which bridges environment and democracy in terms of procedural justice is the UNECE - United Nations Economic Commission for Europe- Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters, usually known as the Aarhus Convention. Signed on 25 June 1998 in the Danish city of Aarhus, the Aarhus convention grants the public rights regarding access to information, public participation, and access to justice in governmental decision-making processes on matters concerning the local, national and trans boundary environment. It focuses on interactions between the public and public authorities. According to Francesca Rosignoli (2020: 68), the Aarhus Convention represents the first institutional step toward a European approach centered on the participation of the public in decision-making processes and on access to environmental justice.

The convention recognizes that "adequate protection of the environment is essential to human well-being and the enjoyment of basic human rights, including the right to life itself" (UNECE 1998: 1), and establishes how procedural environmental justice should be achieved. In particular, it establishes a series of rights of the public (of individuals and their associations) in environmental matters by stipulating that each party to the convention must possess the necessary information provided by public authorities at the national, regional, or local level which ensures that these rights become effective.

Three pillars on which the convention is based:

- 1) Access to environmental information (art. 4-5)
- 2) Public participation in environmental decisions (art. 6-8)
- 3) Access to justice (art. 9)

First, access to environmental information implies that public authorities are obliged to provide the environmental information in their possession. In article 5 the convention states "Each Party shall ensure that public authorities, in response to a request for environmental information, make such information available to the public, within the framework of national legislation" (UNECE 1998: 7). Again in art. 5, "Each Party shall ensure that: (a) Public authorities possess and update environmental information which is relevant to their functions; (b) Mandatory systems are established so that there is an adequate flow of information to public authorities about proposed and existing activities which may significantly affect the environment" (UNECE 1998: 8). Finally, again in art. 5 the convention says that "each Party shall ensure that, within the framework of national legislation, the way in which public authorities make environmental information available to the public is transparent and that environmental information is effectively accessible, inter alia, by (...) providing sufficient information to the public about the type and scope of environmental information held by the relevant public authorities, the basic terms and conditions under which such information is made available and accessible, and the process by which it can be obtained (...) each Party shall ensure that environmental information progressively becomes available in electronic databases which are easily accessible to the public through public telecommunications networks. Information accessible in this form should include (UNECE 1998: 8).

Second, public authorities are required to allow public participation in environmental decision-making, giving the public and non-governmental environmental organizations the opportunity to comment on proposals for projects that affect the environment. For instance, art. 6 affirms "the public participation procedures shall include reasonable time-frames for the different phases, allowing sufficient time for informing the public (...) above and for the public to prepare and participate effectively during the environmental decision-making (...) each Party shall provide for early public participation when all options are open and effective public participation can take place (...). Each Party should, where appropriate, encourage prospective applicants to identify the public concerned, to enter into discussions, and to provide information regarding the objectives of their application before applying for a permit" (UNECE 1998: 10) And furthermore that "Each Party shall make appropriate practical and/or other provisions for the public to participate during the preparation of plans and programmes relating to the environment, within a transparent and fair framework, having provided the necessary information to the public (UNECE 1998: 11).

The third states that, each party, within the framework of its national law, ensures that anyone who considers that their request for information has not been dealt with in accordance with the two aforementioned rights or with environmental legislation has access to appeal procedures before a court or other independent and impartial body established by law. This can be found also in other European laws, such as the PPC Directive

2010/75/EU on industrial emissions, integrated pollution prevention, and control. Its article 25 regards the access to justice and states "Member States shall ensure that (...) the public concerned have access to a review procedure before a court of law or another independent and impartial body established by law to challenge the substantive or procedural legality of decisions, acts or omissions"

Despite how the Aarhus convention, as Julian Agyeman, Robert Bullard, and Bob Evans (Bullard et al. 2002: 86) have argued, "is unique in being the first to ensure citizens' rights in the field of the environment", a few drawbacks can be underscored.

For instance, although the Aarhus Convention requires institutions and bodies to provide for public participation in the preparation, modification, or revision of "plans and programs relating to the environment", the convention allows "only" environmental NGOs that meet certain criteria to apply, pursuant to environmental legislation, an internal review of acts adopted or omissions by EU institutions and bodies. The criteria enshrined in Article 11 of the Aarhus Regulation seem to limit rather than extend the range of potential actors. Furthermore, although the revisions of the Lisbon Treaty have partially improved the conditions for individuals to present a reminder of annulment, the restrictive interpretation of the admissibility requirements adopted by the Court of Justice of the European Union has reinforced "the traditional limited access to justice for individuals, groups, and other associations that are unable to meet the requirements of the Aarhus convention, de facto undermining the spirit of the convention" (Rosignoli 2020: 71). According to Altiero and Dakli (2015) the distinction between "public" and "concerned public" represents a limit to the access to information and justice regarding environmental issues. In the Aarhus Convention such distinction is made in relation to who can access environmental information (public) and who can access justice (concerned public). In Altiero and Dakli's argumentation, all environmental information should be provided without distinguishing between the "public" and the "concerned public".

In the light of the already quoted Michele Callon's model (1999) on the relationship between lay and expert knowledge, it is apparent that the Aarhus Convention, while well concentrating the efforts to experiment with an interaction with a concerned public belonging to model 2 by Callon, it also is evident that it does not go beyond model 2 nor tries to reach the model 3 of co-production. In reference to the spread of institutions of public debate throughout European countries, of which the French case is the most prominent, they are an emblematic example of the attempt to put into practice the creation of an arena of informed discussion between a concerned public, institutions, and operators who create infrastructure with potentially high environmental impact. The institutionalization of participation is rooted in the procedural idea of justice, according to which improving the rules of the decision-making process would achieve justice.

Whereas I generally agree with this view, my research experience has revised my opinion on this since mass participatory tools, such as public debate, are not always able to take into consideration insurgent practices which are not typically acknowledged, enabled and involved, but are nevertheless valuable. Another critical point in this regard is the setting of priorities once the involvement of the public in decision-making processes

is decided. Often, the public can only affect a small part of the entire decision-making process, without having the chance to reject it entirely, but rather only possessing the option to give suggestions. To the contrary of this diffused praxis, I agree with the Center of Documentation of Environmental Conflicts' argument which regards the fact that EU should supplement EU Directives with binding tools to ensure the protection of human health over economic requirements, providing for the suspension of industrial plants when health risks are identified until those risks are eliminated or reduced to a minimum level (Altiero and Dakli 2015).

Another aspect I want to point out is in regards to how the construction of knowledge is reflected in the Aarhus Convention. While Altiero and Dakli (2015) maintain that it is necessary that the collection of data on the condition of the premises before, during, and after the cessation of an activity, or in the planning stage, should be carried out by the public administration rather than to be left to the operator, I believe that even more agency should be given to community knowledge. The Aarhus convention was a groundbreaking document at that time when it was envisioned and approved, but it looks anachronistic if we look at it from the lens of the most recent academic debates on the open science movements and citizen science. The Aarhus convention does not explicitly refer to the co-production of knowledge and how to promote it in a way that local, indigenous, and vernacular knowledge can be inserted into the evaluation, assessment, and decision process regarding environmental issues. By digging into the Aarhus Convention, it is evident that it still represents a crucial document on the relationship between democracy, justice, and environmental issues, but the topic of constructing knowledge is almost missing in it. This gap is hence a future road that may be further explored and converted into new conventions and international documents. A management plan has to be developed for each Natura 2000 site⁴². These plans contain information such as the geographical-administrative framework, the naturalistic framework with highlighting of the habitats and the flora-vegetational and faunal species present; conservation measures, a habitat map, and cartographic framework highlighting the current perimeter and the one proposed at scale for the sites of special and community interest subject to the management plan. The knowledge regarding all these Natura 2000 sites is processed by experts, professionals and scientists with the goal to protect and conserve these areas. The involvement of local subjects takes place through the so-called "public participation" phase in which citizens, individual or associated in organizations, can access the contents of the Plan documents and, if necessary, submit observations. It should be stressed that, despite these instruments have been included at the European level, the responsibility of managing, approving and enforcing them is of the competent regional bodies.

⁴² Natura 2000 is a network of nature protection areas in the territory of the European Union. It is made up of Special Areas of Conservation and Special Protection Areas designated under the Habitats Directive and the Birds Directive, respectively. Natura 2000 was established by Article 3 of Directive 92/43 / EEC on the conservation of natural and semi-natural habitats and of wild flora and fauna. The implementation of the "Habitat" directive took place in Italy through Presidential Decree 357/1997, modified and integrated by Presidential Decree 120/2003.

It is worth noting that at intra-national and international levels, the European Community and the UNESCO have played a crucial role in elaborating policy tools aimed to tackle both environmental issues and involvement of local communities. For instance, the Habitats Council Directive 92/43/EEC has systematized the categories of Site of Community Importance (SCI), the Special Protection Areas (SPA) and the Special Areas of Conservation (SAC) and classified them as a part of the European network Rete 2000. The directives insert the “Management Plan” that is a law tool whose main goal is the planning and the preservation of these categorized areas by taking on a biocentric and ecocentric perspective, i.e. giving attention first to all the other-than-human critters, plants, animals, environmental matrices inhabiting all those areas of special protection and of community importance. The Management Plan has the objective of guaranteeing the maintenance of the delicate ecological balance underlying the protection of habitats and species and of identifying innovative and best management models that allow the conservation and enhancement of these areas.

Finally, a most important, another relevant law concerning the risk, and more specifically the industrial risk, is the Seveso III Directive 2012/18/EU regarding the control of major accident hazards involving dangerous substances. Differing from EPA directives in the US that are established at the federal level, Seveso III, as European directives, is implemented at a European level but needs to be applied at the national level by member states in order to be enforced and become effective. For this reason, I will talk more about it in the next paragraph.

To sum up, I have dug into a selection of European documents, laws, and conventions that have addressed the topic of risk and I looked at them by scrutinizing how they have intertwined, or not, risk with the construction of knowledge about risk. What has emerged is that there is almost an absence of a normative framework on how to democratize the construction of knowledge about risk and even more so about industrial risk. While both Parma and Ostrava protocols have the indisputable merit of bringing into the assessment of the environmental issues the social justice topic, including the gender, ethnic, racial inequalities, they do not refer to all the sacrifice zones and communities that have been slowly contaminated over time, nor do they make any explicit reference to the co-production of knowledge. A bigger focus on the role of lay people can be found in the Aarhus convention which represents a watershed of the environmental policies at the European level since it calls for a guarantee for transparent information and access to environmental data. However, notwithstanding its innovativeness, it does not challenge that dichotomous model of expert-lay knowledge. A few experimentations in this direction have been carried out in Italy, which I will present in the next paragraph.

Risk Knowledge and Socio-Environmental (In)justice: Italian level

Catastrophic events have been direct and indirect triggers of policy changes concerning the assessment and mitigation of risk both at the international and national level⁴³. The Seveso Directives, which represent the main European laws on industrial risk, are an emblematic case since they were issued after the catastrophic event that occurred at the ICMESA's⁴⁴ chemical plant in Meda (Lombardy, Italy) in 1976, the "Seveso disaster"⁴⁵. The Italian industries considered to be at risk of major accidents are registered by the Ministry of the Environment under a specific "National Inventory of Plants likely to cause major accidents". In 2005, the Ministry of the Environment included in this particular national inventory 70 industries operating in the Sicilian region; 34 of these were classified as having a high risk of a major accident. Since then, both awareness by citizens and public institutions and debates in academic and scientific circles on risk have led to many changes, such as the introduction of national, European⁴⁶ and international regulations which aim to prevent or mitigate possible hazards. However, the Seveso disaster not only has shown the need for societies committed to facing self-produced risk (Beck 1992) to create new risk-related regulations, but it has also unveiled how risk involves all of the environmental matrices.

In light of international debate discussing risk as a socio-eco-systematic-landscape concept, the European (Altiero and Dakli 2015) and Italian regulations still need improvements. In Italy, there is no holistic legislative framework on risk; rather, each type of risk (seismic, hydraulic, environmental, etc.) is regulated by a specific law. This results in a fragmented patchwork of decrees, emergency ordinances, and special resolutions. According to Filippo Gravagno and Salvo Messina (2008: 14), these normative weaknesses are even more apparent in the Italian legislation on contaminated areas, since it still does not consider risk as an eco-systematic phenomenon percolating into all entangled environmental components underlying the landscape.

The Seveso II Directive, in particular, was initially adopted in regards to the control of major accident hazards involving dangerous substances (96/82/EC). When it was replaced by the Seveso III Directive (2012/18/EU)

⁴³ Other examples are the 1884 cholera epidemics in Naples that led the national government to issue the "Legge per il risanamento di Napoli" (Law for the rehabilitation of Naples) which brought into the urban planning field a series of hygienic-sanitarian aspects aimed to reduce health and contamination hazards, above all in the peripheral areas. Another example, slightly more than a century later, is the Chernobyl disaster, which influenced the popular referendum that was held in Italy on 8-9 November 1987 and resulted in a ban on nuclear plants, as narrated in the book *Il virus del benessere* (Saverio, 2009: 170-188).

⁴⁴ Industrie Chimiche Meda Società Azionaria (ICMESA) was a Swiss chemical industry that operated in the city of Meda, on the border with the municipality of Seveso.

⁴⁵ For more information on the Seveso case, see Centemeri, 2006; Galimberti, Citterio and Losa, 1977; Ramondetta and Repossi, 1988.

⁴⁶ The first version of the Seveso directive was issued in 1982 and regards the major-accident hazards of industrial activities (82/501/EEC).

in Italy through Legislative Decree 105/15, a series of relevant issues were introduced: technical updates on the classification of dangerous substances, accessible information, justice, and participation in decision making for citizens; measures to improve the availability and sharing of information. Bruna De Marchi, a sociologist who specialises in public participation in health and environmental and disaster policies, emphasises that, among the effects of Seveso III, there is “the recognition of the need and importance of an extended responsibility, founded on the commitment and participation of a multiplicity of actors” (De Marchi 2001: 177).

Despite these innovative aspects, when scrutinizing the current law, it emerges that:

1) Legislative Decree 105/15 concerns “relevant accidents” (Art.3) only, such as fires, explosions, and leaks of toxic substances. This means that the diffused, slow contamination seeping day by day into the environmental matrices and human and non-human bodies – i.e. the already mentioned “slow violence” (Nixon 2011) and “slow disasters” (Knowles 2014) – are not taken into consideration.

2) Legislative Decree 105/15 promotes the public communication about harmful events (Art.23) but this public involvement is mostly unidirectional, highly bureaucratised (Art.24), and hence far from the idea of transparency and co-production of knowledge (Carrozza 2014; May and Perry 2017; Durose and Richardson 2016) wished in the SF, in the post-normal science (Funtowicz and Ravetz 1992) and in the open science movement (Elliot and Resnik 2019).

3) Legislative Decree 152/06 regarding the decontamination of Italian RSINs—Remediation Sites of National Interest⁴⁷ [Figure 2]-which are highly contaminated areas classified as dangerous by the Italian State and in need of decontamination- is insufficient since remediation works are mandatory only in proximity to the source of contamination (Art. 240), without considering diffused damages and losses in the ecosystems.

The Italian laws regarding industrial risk do not consider that the potential damage is neither predictable nor fast-moving, in terms of both time and space. On the contrary, the potential contamination harm affecting an extensive area is always diffused into all its human and non-human elements; it is thus reductive to simply predict or strictly model it.

Despite the previously mentioned epistemological, cultural, and normative references – that give attention to the slow, small, subaltern, lay aspects of constructing knowledge – the Italian legislation on industrial risk does not include any specific recognition to lay knowledge on risks. Relying on highly specialised knowledge produces as a collateral effect a highly fragmented normative, which seems unable to look at landscapes of risk holistically. The main Italian law concerning industrial risk, although it has introduced several innovative changes, such as updates on guaranteeing access to information, justice, and participation in decision-making for citizens, presents a whole series of shortcomings (Privitera 2019).

⁴⁷ Introduced by the Legislative Decree 22/97, modified by Legislative Decree 152/06, the SIN areas are 58 in total.

The concept of contaminated site - understood as a portion of the territory in which more than one environmental matrix is contaminated, and the causes of this contamination are interconnected- was introduced by Law 349/46, with the definition of "areas at high risk of environmental crisis". Subsequently, Legislative Decree 22/1997 introduced the concept of "remediation", and Ministerial Decree 471/1999 made available criteria, procedures and methods for the safety, remediation and environmental restoration of contaminated sites.

This Decree was then replaced by Legislative Decree 152/2006 which, for the identification of a contaminated site to be remediated, no longer provides for a comparison with a series of predetermined limit concentrations for a series of substances, but for exceeding threshold concentrations. defined through the application of a site-specific risk analysis, according to the characteristics of the area (type and extent of contamination, type of soil, depth of the aquifer, etc.).

Subsequently, in January 2013, the Decree of the Ministry of the Environment and Land Protection (MATT) was published with the list of Sites of National Interest for Remediation (RSINs) which, not meeting the requirements of Legislative Decree 152 of 2006 and subsequent amendments and additions, have been classified as being of regional interest.

The key environmental legislation is Legislative Decree no. 152/2006, the Environmental Consolidated Act (ECA) (Norme in materia ambientale or Codice dell'Ambiente). The ECA has six parts:

- Environmental general principles.
- Environmental Impact Assessment (EIA) (see Question 17) and Integrated Pollution Prevention and Control (IPPC) permit (autorizzazione integrata ambientale) (AIA) (see Question 4 and Question 5).
- Water resources management (see Question 6 and Question 7) and soil protection.
- Waste and packaging management (see Question 19 and Question 20).
- Remediation of contaminated sites (see Question 22 to Question 25).
- Air protection and air emissions (see Question 8 to Question 10).
- Environmental damage.

Regarding the remediation of contaminated sites, the regulations are based on the polluter pays principle, with liability determined by a causal link between an action or an omission and an event of pollution.

Remediation is approved by the competent authority, which may vary on a case-by-case basis, and the approval states the financial guarantees to be posted by the party who is responsible for clean-up (paragraph 7, Article 242, ECA). If the polluter is not identified, or if identified does not have the economic resources for the clean-

up, the local public authority carries out the clean-up (Article 250, ECA). Where the local authority carries out the clean-up, a registered lien is taken over the site.

The presence of the main contaminated areas in Italy mainly concerns small and medium-sized municipalities (263 municipalities with less than 80,000 residents at the 2011 Census), even if some polluting industrial plants, which have given rise to contaminated sites over time, are located contiguously of major cities. The history of the local communities residing in medium and small municipalities included in the contaminated sites has been influenced for decades by the presence of the plants and by industrial activities which, if they initially provided work and improved the quality of life of some of the communities, at the same time have gradually led to environmental contamination and the deterioration of the natural and built living environment, and have influenced the health of the communities.

The main contaminated sites subject to reclamation -the already mentioned RSINs⁴⁸- in Italy are subjected to epidemiological surveillance SENTIERI (National Epidemiological Study of Territories and Settlements Exposed to Pollution Risk), a system developed by the Italian National Institute for Environmental Protection and Research (Istituto Superiore per la Protezione e la Ricerca Ambientale - ISPRA)⁴⁹. This system describes and periodically updates the health profiles of the communities who live close to contaminated sites in order to provide evidence and indications for prevention to support decision-making processes for the protection of public health (Zona et al. 2019). SENTIERI also investigated social inequalities in the 44 monitored areas, using an index of multiple poverty at the municipality level, computed using data from the 2001 national census (Pasetto and Iavarone 2020). The index is derived from a combination of census variables associated with the socioeconomic dimensions of education, employment and material deprivation. The result showed a clear pattern that municipalities with the highest social distress are almost twice as likely to be located in a contaminated site area. Of municipalities close to national priority contaminated sites, 60% fall into the two most underved quintiles, whereas only 24% belong to the two most affluent quintiles. (Pasetto et al. 2019: 91). [Figure 3] shows the results of a spatial analysis of deprivation levels of communities close to contaminated sites by region (north; central; south and islands). It highlights a marked north–south gradient, with worst conditions in the south and islands, where 82% of municipalities close to national priority contaminated sites fall into the two most deprived quintiles (1 and 2). In central Italy 50% of municipalities close to such sites belong to the most deprived quintile, but the middle quintiles (2–4) are more balanced. In the north the pattern is reversed, but the disparities are weaker. It is suggested that a possible explanation for this pattern involves

⁴⁸ The sites identified by the Ministry of the environment and territorial protection were 57 scattered throughout Italy (law 8 July 1986 n. 349 - art. 7). They were reduced to 39 with the Ministerial Decree of 11 January 2013.

⁴⁹ Istituto Superiore per la Protezione e la Ricerca Ambientale (ISPRA - Italian National Institute for Environmental Protection and Research) is a public legal entity subject to the vigilance of the Italian Ministry for the Environment, Territory and Sea, and provided with technical, scientific, organizational, managerial, administrative and financial autonomy.

the marginalization of local communities during the industrialization process in southern regions of the country.

In light of the aforementioned studies, it can be noted that recently, Italian epidemiological research groups belonging both to ISPRA and to other research teams have attempted to merge environmental justice topics and epidemiological studies (Pasetto et al. 2019; Marsili et al. 2020; Pasetto and Rosignoli 2020; Pasetto et al. 2021). Those studies have tried to intersect the data coming from environmental assessment with the data regarding the level of deprivation in order to emphasize how social and environmental justice are two sides of the same coin. The conclusion of these studies is that "to reduce the conditions of procedural injustice in contaminated sites, local communities must be placed at the center of decision-making processes" (Pasetto et al. 2021: 39). Other participatory epidemiological studies have demonstrated the role of barefoot epidemiological methods – that is based on observations and data collected on the ground, not following pre-defined protocols – as a way to co-create epidemiological knowledge in partnership with fenceline communities (De Marchi et al. 2017). Applied in Manfredonia by mixing storytelling and participatory methods, this experience of a participatory project in environmental epidemiology has allowed the assessment of long-term effects of an industrial disaster that occurred in 1976 by crisscrossing the collective memory and public perception of toxicity with the available public health data. The jazz of these ongoing practices, albeit carried out by a hybrid group of researchers and activists, has not been able to radically affect the current normative. One of the few laws that is worth mentioning because it seeks to bring together environmental issues and (procedural) justice issues is the Regulation on "public debate" which entered into force in August 2018 in Italy. This regulation regards the implementation of Article 22 (paragraph 2) of the Code of Public Contracts, and, inspired by the French *public debat*, it prefigures the participation of citizens right, not only in problem solving, but in the problem's setting, any time decision on works of public interest needs to be made. The main characteristics of the public debate is its trend to put into practice a deliberative democracy, i.e. well-defined methods and dedicated experts are necessary, as well as involving all the interested parties, the managers, the competent scientific world and the designers around a table, who must ultimately explain how they will take all opinions into account in the final draft. Despite this law representing an important step toward a deliberative democracy, it fails to regard the representations of those who are not considered concern groups and who, more often, are subaltern and marginal. In addition, a type of institution, such as the public debate, may not be inclusive and comprehensive enough of difficult situations in which mediation and negotiation tools may be not successful (Musselli 2019)⁵⁰.

I believe that also a brief, despite incomplete, analysis of the Italian planning tools introduced by law may help to draw attention to if and how planning incorporates the themes of socio-economic justice and of environmental sensibility into its normative. The institutionalization of planning in Italy is relatively recent

⁵⁰ I am referring to all a series of Italian movements against the construction of huge infrastructure, such as NoTAV; the extension of drilling concessions to oil companies, such as NoTRIV; the Trans-Adriatic Pipeline, called NoTAP.

and with its origins in the '30s when the first mandatory planning tools were introduced in the law. Since the '70s, a series of laws on environmental protection and remediation were created, the most famous one, the "Ronchi Decree" (L.22/1997), later merged into other laws, has provided relevant news on the waste identification, the environmental declaration and remediation work for which the Ministry of Environment is responsible. All these laws and normative tools rely on a creative and scientific delegation of experts (Saija 2012) while the people, including the insurgent knowledges they embed, can "participate" in all these processes by accessing already elaborated documents in order to provide possible opinions, called "observations" on them. The regional and local authorities can decide whether or not to accept such observations.

This partial and incomplete revision of the main Italian laws on risk knowledge and socio-environmental (in)justice tells us that even if the current regulation framework provides some normative tools to refer to, it can simultaneously be seen as having points of potential further developments. In particular, the Legislative Decree 105/15 (Seveso III) treats industrial risk as mainly related to a dangerous accident having punctual and immediate effects, by doing so; these laws do not address any forms of slow everyday disasters. The directive does not really try to compensate for such a gap by, for instance, including by law paths of active listening and co-production of knowledge. In this regard, the Legislative Decree 105/15 (Seveso III) mainly guarantees the information, transparency, and communication of environmental data, while the law about public debate institutionalizes the participatory deliberative process but under the specific condition of construction of buildings of public interest. In both cases, the role of the human (let alone non-human!) dimension of knowledge is left aside if not absent. A trend that is repeated also in the regional and local laws, which I will present in the next paragraph.

Risk Knowledge and Socio-Environmental (In)justice: Regional and Local level

In this paragraph I will examine how the regional and local government land decision-making process in regard to risk knowledge is constructed. In more detail, we can see three main types of normative tools at the regional/local level: the more typical regional and town plans belonging to the urban and town planning regulations; the industrial risk normative tools that, most frequently, treat the industrial risk in terms of precaution of emergencies and accidents; the regulation regarding the bio-monitoring of both people and ecosystems living close to dangerous plants and areas.

In regard to typical planning tools, the Regional Territorial Plan (PTR) is the tool for territorial projection of the short, medium, and long-term economic and social development strategies with which the Region of Sicily coordinates the programming of resources and strategic planning of territorial coordination and urban planning of metropolitan cities, free municipal consortia and municipalities, single or associated. According to the most recent Sicilian law concerning the government of the territory, Law n.19 / 2020, the PTR contains the general framework of the objectives and measures of protection to pursue in the different parts of the regional territory, constituting these invariant or complementary elements to the choices within territorial and socio-economic

development. The provisions of the PTR prevail over any deviating or inconsistent provisions contained in the territorial plans of local authorities. The PTR can also provide for forms of inter-municipal, environmental and energy territorial compensation for interventions that determine significant impacts on the territory even in municipalities not directly affected by the interventions themselves. To this end, the PTR indicates how to jointly divide the consequent advantages and burdens among the local authorities, in relation to the different development potentials and the sustainability constraints deriving to each one from the contents of the regional programming. It should be noted that the PTR is drawn up by the Regional Department of the Territory and the Environment on an information basis produced by the SITR - the regional territorial information system, based on data collected and systematized on GIS. The procedure for the formation of the Regional Territorial Plan provides that all interested parties can view the PTR project filed and submit, within sixty days before the date of publication of the plan, comments, and proposed amendments. The territorial plan is published in the Geoportal managed by S.I.T.R. Territorial Data Infrastructure of the Sicilian Region. The same procedure of formation of the plans can be seen at local levels, reproducing a mechanism of "creative mandate" (Saija 2012) that de-responsibilize, if not exclude, the authentic involvement of citizens and their insurgent knowledge.

With Legislative Decree 238/2005, the Civil Protection assumes an important role in the coordination of aid and in the implementation of the External Emergency Plans. Furthermore, the Department of the Presidency of the Sicilian Region, with D.D.G. n. 1178/2005, established the Environmental and Industrial Risks Service at the Regional Department of Civil Protection, which has the following responsibilities: "forecasting and prevention of environmental, health, veterinary, industrial, nuclear technology and anthropic-psychology of catastrophes - emergency planning related to the relevant risks and guidelines for emergency activation plans and emergency interventions". An example of the operational activities of the Environmental and Industrial Risks Service relating to the problem of industrial risk is the creation of a regional database of the industrial plants at significant risk in Sicily that have been mapped through the Territorial Information System. Another example is the draft of the PEEs - that is, the External Emergency Plan schemes for industrial plants together with a technical commission designated by the Regional Prefecture.

The accidental events considered in the Plan outline are identified by the information provided by the manager of the place that is the source of the danger. In these situations, different risk scenarios are identified and the extent of the danger, first aid measures, fire prevention measures, physical and chemical and toxicological and ecological properties of the source of danger are indicated. Once drafted and approved, the contingency plan is posted online. Of the production-industrial plants likely to cause major accidents present in the national inventory, there are also numerous in Sicily. In particular, following the planning of the 1950s by ASI - Industrial Development Areas - and by the Cassa per il Mezzogiorno, the most critical areas at chemical risk are today the industrial pole built in the short stretch of coast that goes from Syracuse to Augusta, that of Gela and Milazzo.

The presence of this high number of industrial plants at risk of major accidents in the Sicilian territory was not a deterrent for urban development: almost all the plants are adjacent to densely populated urban centers that can be seriously affected by the consequences of industrial accidents. If the mandate of constructing knowledge aimed at the planning and transformation is mostly delegated to expert planners drafting and designing local and regional plans, the industrial risk knowledge and management mostly follow the same path. Industrial risk is, at most, faced by mobilizing quantitative data through which to predict the potential risk in case of accident and emergency. No normative room is left to slow and diffused damages over time and space, as well as no normative room is left to listen, validate, and collect insurgent knowledge and practices coming from the bottom.

Finally, another group of normative tools connected with risk landscapes is the bio-monitoring of contaminated places.

As we have seen in the previous paragraph, expertise on industrial risk regulation in Italy is performed by technicians from ISPRA (Istituto superiore per la prevenzione e la ricerca ambientale). ISPRA is the national agency for environmental protection and is implemented in regional agencies on the Italian territory called ARPA (Agenzia regionale per la ricerca e la prevenzione ambientale). The agencies are under regional or provincial administration and their main role is natural environmental protection, with the task of keeping the natural environment under control and verifying environmental regulations. These regional agencies are boundary organizations (Pellizzoni 2011) performing at the same time scientific and technical expertise, policymaking tasks, and consultancy. The experts on the industrial risk of the ARPA are mainly chemists and chemical engineers. These experts act as judicial police in the event of non-compliance with the law. They also carry out inspections in industrial companies, as specified by Italian Law 339/1999, which transposes the European Directive known as “Seveso II” of 1996 on industrial risk prevention. ARPA deals with air quality monitoring and remediation work in contaminated areas as well as with the zoning of the Sicilian territory in areas to which a specific function is recognized or attributed with the consequent attribution of constraints and other limits to be observed for each area. The ARPA’s experts interact on a daily basis with their counterparts in the private sector, they have gained detailed knowledge of the site’s industries. Furthermore, the public and private sector technicians have built a common language based on shared scientific and technical references that even further exclude citizens⁵¹. This is facilitated by the fact that some ARPA technicians often worked in the private sector before reaching the public sector. The collaborative and mutual trust relationship established between experts from the public and private sectors, is one of the reasons why technocracy is still persistent in industrial risk.

⁵¹ These contents refer to a still unpublished work, this is why I can not yet quote it.

Final remarks

This brief and partial journey through some relevant normative frameworks dealing with risk landscapes at International, European, Italian and regional, and local levels, conveys the fault and potentialities inside regulations. It is evident that the International agreements have appealed for integration between vernacular/local and expert knowledge, viewing this merge as an essential step toward the mitigation of risk. Emblematically, many of the Sendai Framework articles are dedicated to a democratization of the construction of risk knowledge by increasing information and communication. However, it is worth noting that the Sendai Framework tackles the risk mostly in terms of evaluation and mitigation of abrupt natural hazards and disasters, instead of risk coming from slow everyday disasters. At the European level, the Aarhus convention has the undeniable merit of having formalized the importance of transparency, communication, and access of citizens to environmental data as a way to reduce environmental injustice. Similarly, the Parma and Ostrava declarations have set off and confirmed the right to access data and emphasized, for the first time in a more institutionalized way at the European level, the inescapable nexus between environmental burdens and socio-economic inequalities permeating our society.

The legacy of the vivid academic debate on environmental and climate justice at the international scale, both in academia and in a few international documents, is, somehow, mirrored in a very recent body of works and publications by a few Italian epidemiological research groups that aim to bring environmental justice topics into the Italian academic debate more robustly. While I recognize that these works are groundbreaking in relation to the current Italian academic debate, I believe that further exploration can be achieved on how epidemiological surveys can underscore how environmental injustice forms and how more environmental justice may be achieved.

Moreover, in this chapter, I unearthed the main drawbacks of the predominant laws concerning industrial risk in Italy, in particular the so-called Seveso directive. The Seveso directive, despite being innovative at the time of its publication, is limited both on the topic of public access to environmental information and on industrial risk as a mere accident causing punctual and sudden damages. These limitations, at different scales, can be found at the regional and local levels, where the planning tools dealing with risk landscapes are quite traditional and characterized by a total absence of tools aimed to enable and include insurgent planning practices and knowledge. The management of industrial risk at the regional level is in the hand of special corps (Protezione Civile) -that treat the industrial risk in terms of accident and emergency- and in the hands of experts into ARPA who, in light of previous research, instead of democratizing knowledge, seems actually act to maintain technocracy monopoly.

The aforementioned shortcomings of the legislation on industrial risk in regards to the knowledge-building process and socio-environmental justice indicate the normative gaps to be challenged and improved, or in other words, indicate the future path of research to be explored.

Within my research, I aspire to envision a methodological and epistemological shift whose desirable outcomes would include an impact on the regulations regarding industrial risk at various levels of land, government, and spatial scale.

1.4. Gaps and opportunities in the construction of risk knowledge in/on risk landscapes by trespassing disciplines⁵²

By seeking to be “undisciplined”, this chapter explores the opportunities and criticalities of the way environmental justice studies, environmental humanities, and political ecology have adopted the debate related to the risk topics. In this chapter I seek to analyze how these fields of knowledge have dealt with the construction of risk knowledge in ways that have unearthed the systemic injustice underpinning environmental issues. In particular, it focuses on toxic and contaminated places where slow violence is perpetrated to the detriment of powerless and “expendable communities”. With the drawback of often limiting themselves to a critical and not practically engaged role, these same disciplines have the merit of supporting the potentialities of toxic autobiographies and resistant practices as ways to envision possible anti-extractivist alternatives based on ecology, commons, and solidarity self-organization.

The “risk” of the unjust Anthropocene discourse

The risk theories and debates -including the analysis of risk causes and of solutions to be found or into technology and expert knowledge or into democratic progress and alternative knowledge- may provide insights for reading the current vivid discussion on the Anthropocene within academia, especially inside the humanities field. In particular, in my opinion, the Anthropocene discourse can be conceived as a follow-up of the risk society debate but in light of an increasing feeling of emergency and a multi-layer and multi-disciplined approach, i.e. that our earth is at risk is anything but new, nevertheless, the way we talk about it has changed and has been diversified over time.

Envisioned in 2000 by the Nobel Prize-winning atmospheric chemist Paul Crutzen and the biologist Eugene Stoermer (Crutzen and Stoermer 2000), Anthropocene indicates an unprecedented epochal effect: the massive impact by the human species, from the industrial era onward, on our planet’s life systems, an impact that, as the term suggests, is geomorphic, equal in force, and in long-term implications to a major geological event. Due to what has been dubbed the “Great Acceleration” (McNeill and Engelke 2014), a second stage of the Anthropocene Age dated around the mid-twentieth century has caused a high-speed modification of the human-society-environment relationships and of the huge impact on the last element of this triad. The Anthropocene is a notion through which to refer to how human actions have become the main driving forces behind some basic Earth systems, such as the carbon cycle and the nitrogen cycle, and the general human impact on the earth and its biosphere, lurched upward to new levels.

⁵² This chapter was written during my period as a visitor to the Department of Environmental Studies at the UCSB as a Fulbright fellow under the supervision of Prof. D.N. Pellow.

While the Anthropocene is literally based on a geological strata accumulating the traces of humans on the texture of the planet (Crutzen and Stoermer 2000), it is also a historical tale that goes far beyond the specific issues studied by geologists.

It is not by coincidence that this concept has been the object of several re-significations and re-definitions.

Among the alternative Anthropocene declinations, there is the one by Donna Haraway (2015; 2016) who defines it more as a boundary event than as an epoch marking severe discontinuities between what comes after and what comes before. In her argumentation, Haraway maintains that the name Anthropocene is not able to catch the dynamic ongoing sym-chthonic forces and powers of which people are part, within which ongoingness is at stake. This is why she proposes, instead, to call it Chthulucene which is a term more able to entangle myriad temporalities and spatialities and myriad intra-active entities-in-assemblages – including the more-than-human, other-than-human, inhuman, and human-as-humus (Haraway 2015: 160). Chthulucene is a compound word of two Greek roots (khthôn and kainos) that together name a kind of time place for learning to stay with the trouble of living and dying in responsibility for a damaged Earth (Haraway 2016: 2). Haraway's proposal is to "make kin" sin-chthonically and sym-poetically with assemblages of companions and critters being part of nature in order to "stay with the trouble", make and compose with the earth-bound. With this re-interpretation, Haraway calls for a "multispecies justice" which embraces all connecting disparate realms of life in potentially collaborative and creative webs of kinship. She invites us to join the tentacular thinking and action to unravel the ties of both genealogy and kin; kin and species. Haraway criticizes that the Anthropocene has obtained purchase in popular and scientific discourse in the context of ubiquitous urgent efforts to find ways of talking about, theorizing, modeling, and managing a "Big Thing" called Globalization but does it by lending itself too readily to cynicism, defeatism, and self-certain and self-fulfilling predictions, like the "game over, too late" discourse (Haraway 2016: 55). Instead, in the "Chthulucene story" the chief actors are not restricted to the too-big players in the too-big stories of Anthropos, but are human and nonhuman players, all necessary for assembling every fiber of the tissues of Gaia⁵³.

Another alternative designation of the Anthropocene is the Plantationocene that points to the ongoing socio-ecological consequences of plantation agriculture and the permutations and persistence of the plantation across time and space (Haraway 2015; Tsing 2015). While Plantationocene deserves credit for giving importance to the analysis of the spatial history of the plantation in understanding the present since it sheds light on the devastating transformation of diverse kinds of human-tended farms, pastures, and forests into extractive and enclosed plantations due to what Vandana Shiva has called "the law of domination" and "knowledge terrorism"

⁵³ The Gaia hypothesis proposes that living organisms interact with their inorganic surroundings on Earth to form a synergistic and self-regulating, complex system that helps to maintain and perpetuate the conditions for life on the planet. The Gaia hypothesis has attracted criticism.

(Shiva 2016) until the most sneaky biopiracy strategies⁵⁴, however, some scholars have highlighted how the multispecies framing risks minimizing the role of racial politics and leads to a flattened notion of “making kin” that is unable to question the racial and colonial logics of the abstract universal Anthropos (Davis et al. 2019; Pulido 2018).

In agreeing with this last critique, in my perspective, both the Chthulucene and Plantationocene have the undeniable merit of deconstructing and expanding the mainstream Anthropocene discourse by placing great importance on the "small stories" to disclose the alliance between species, to obtain a deep interspecies justice, and to cultivate respons-ability aimed at an ecology of practices, of collective knowing and doing.

It is worth highlighting that, despite those two interpretations recognizing the managerial, technocratic, market-and-profit besotted, modernizing, and human-exceptionalist business-as-usual commitments of so much Anthropocene discourse -that in her words “is not simply wrong-headed but also wrong-hearted” in itself (Haraway 2016: 50)- however, they do not carry on a systemic critique of the current socio-economic and ecological dynamics. Nevertheless, other scholars have done this.

A germane example of a firmly political and systemic critical perspective on the Anthropocene comes from Ernstson and Swyngedouw (2019). With their work, they aim to debunk the mainstream discourse of the Anthropocene that has inaugurated a world stage through which orderly narratives of management, science-based intervention, and capital can come together to save Earth, people, and the economy. They argue how this mainstream narrative renders unthinkable to recognize the world as thoroughly constituted by the interweaving of human, technological, and non-human constellations and assemblages. By doing a simile with the Greek classical theater, in which the violence cannot be represented on the scene, but must be out of the stage, they mobilize the figure of “the Anthro-obScene” to recognize explicitly that we live in a cyborgian web of human/non-human entanglements, but also to undermine the utterly depoliticized concept of “the Anthropocene.” In other words, the Anthropocene must be politicized according to the power socio-economic and ecological relationships for being really representative of our era.

The simplistic unquestionable acknowledgment of the Anthropocene, moreover, has been depicted as a “theodicy of the “Good Anthropocene” (Hamilton 2016). According to this strand of critiques, the Anthropocene has been reframed as an event to be celebrated rather than lamented and feared. Despite it being the final proof of the damage done by techno-industrial hubris, the “ecomodernists” welcome the new epoch as a sign of man's (not human!) ability to transform and control nature (Hamilton 2016). Seeing it neither as evidence of global capitalism's essential fault nor of humankind's shortsightedness and rapacity; it reproduces

⁵⁴ Biopiracy happens when researchers or research organisations take biological resources without official sanction, largely from less affluent countries or marginalised people. Biopiracy is not limited to drug development. It also occurs in agricultural and industrial contexts.

the blind trust in humans as the dominator species of nature who use technological tools to keep enforcing their power and ownership over Nature.

Those critical standpoints have led to an enlargement and complexification, both politically and socio-economically, of the concept of Anthropocene, which has been further enriched by other counter-proposals.

One of these re-elaborations has been envisioned by Jason Moore who with the term "Capitalocene" seeks to draw attention to how our historical modern era, including its characteristic environmental risks, has been shaped by relations privileging the endless accumulation of capitals (Moore 2016). Trapped in the capitalist vortex (Walker and Moore 2019) the fate of Earth is deeply bound up with the accumulation of capital and the power relations underlying it. In short, embracing the Capitalocene lens, the Anthropocene ceases to be an abstract and universalistic category and becomes an embodied and socially determined reality in our current society structure (Armiero and De Angelis 2017: 357).

Armiero and De Angelis (2017: 345) note that, whereas the Anthropocene narrative does not speak of structural injustices, economic progress, or inevitable revolutions, Capitalocene uncovers more crosscutting readings of the intertwined unjust relationships. Then, they propose to overturn the angle of observation (and action) by looking at the Anthropocene from place-based struggles over contamination that illuminate the stratification and the embodying of the Anthropocene's violence. By inflecting the concept of Anthropocene with what they have named Wasteocene, they aim to stress the contaminating nature of capitalism and its perdurance within the socio-biological fabric, its accumulation of externalities inside both the human and the Earth's body, (Armiero 2021; Armiero and De Angelis 2017). Wasteocene is a narrative assuming that waste can be considered the planetary mark of our new epoch and linking waste, justice, and the making of our present world. "What makes the Wasteocene are the wasting relationships, those planetary in their scope, which produce wasted people and places" (Armiero 2021: 2). In this conception, the waste is not (only) a thing to be placed somewhere but is a set of wasting relationships producing wasted human and nonhuman beings, therefore wasted places and wasted stories. Waste as a relation (wasting) produces the targeted community rather than solely selecting it as the ideal place for an unwanted facility (Armiero 2021: 2). This implies that the proximity or overlapping of a given community with a contaminating facility is more than a matter of miles and ZIP codes and is more than a distributional issue; rather it is a matter of power relationships.

Differently from other interpretations, through Wasteocene, Armiero not only puts the effort into recognizing and disentangling those wasted relationships underpinning and shaping the wasted landscapes but puts the emphasis on those forces that are fighting to sabotage the wasting relationships. Viz, Armiero brings into the Anthropocene discourse a proactive and alternative hope for the future that is grounded on experimentation of new socio-ecological relationships through "commoning practices" that, with just their existence, represent an ontological resistance stronghold (Armiero et al. forthcoming). This propositional vision may be found as well in the request for "small" attentive practices of thought, love, rage, and care by Haraway (Haraway 2016: 56).

In short, in my perspective, the debate around the Anthropocene and its alternative declinations (Haraway 2015, 2016; Moore 2016; Armiero 2021; Armiero and De Angelis 2016) not only consolidates the awareness on the risk and on the environmental losses and damages coming from the human footprint but, above all, it broadens the risk discourse, so far, mainly focused on the possibility to find a solution to risk through technology and expert knowledge or through democratic progress and lay knowledge. More importantly, the lively Anthropocene debate discloses how environmental issues are interconnected with the increasing social and economic disparities, opening up new reflections on how the "Anthropos" is not a homogeneous social subject, instead, is a multi-nuanced, multi-gendered, multi-racialized one, made by wealthy and poor, oppressors and oppressed, powerful and powerless, both human and non-human.

After all, and consistently, Ulrich Beck (1992) acknowledges the inverse relationship between wealth and living in polluted spaces, of which a typical practical example is the collocation of toxic industry and other sites of ecological harm whereby vulnerable populations live. However, Beck argues that, through a "boomerang effect," the toxic effects, and consequential losses and damages, ultimately migrate back through ecosystems and end up in the air, water, land, or on the dinner plates of the privileged folks who initially benefited from that toxic production system. Therefore, no one is exempt from the risk society, regardless of social class, race, gender, ethnicity, or geographical location. Nonetheless, the ability and possibility of avoiding risk, or at least mitigating its environmental and health impacts, depends largely on socio-economic status and accessible knowledge.

Consequently, the risk is not neutral; on the contrary, it is intrinsically interrelated to preexisting socioeconomic inequalities. Quoting Beck again, "environmental problems are fundamentally based in how human society is organized" (Beck 1992: 81). Hence, to deal with risk, means to deal with socio-economic injustice. This means acknowledging that populations that experience social, economic, political and cultural marginalization frequently experience disproportionate environmental risk from a range of government and industry-driven facilities, policies, and practices. After all, as afore written, the Anthropos is not at all a homogenous subject.

In our earth at risk, the subaltern human and damaged ecosystems, both not having agency and voices, are even more at risk. As we have already seen in Chapter 1.1., again Beck (1992 [1986]) was the one sustaining that the sub-political actors, i.e. citizens and the subaltern, should have the power or at least the possibility, to "culturally interact" (Wynne 1996: 21), to construct "socially relevant transparency" (Elliot and Resnik 2019), and to challenge the monopolistic position of scientific experts and their objective interpretation of environmental risk. Namely, Beck conceives a crucial role played by risk in transforming mass democracy through the cognitive uprising of sub-political actors, from the bottom up of the institutions. In his view, the sub-politic activation means self-organization seeking to be involved in the decisional processes.

Therefore, late modernity has brought an exponential increase in the production and use of hazardous chemical substances, environmental losses, and uncertainties at the basis of risk society. And it is exactly the

misdistribution of environmental degradation that has favored more powerful communities over others, which, of course, lay at the origins of the environmental justice movements.

During the last decades, both the environmental risk, the unfair distributions of burdens and benefits and the community's reactions to these injustices have been more and more scrutinized and, in some cases, supported through engaged research and action-research projects. In the meanwhile, various fields of knowledge, such as political ecology, environmental humanities, social movement's studies, environmental justice studies, have arisen and examined the interplay between environmentalist movements, environmental injustices, and the spatialization of inequalities. All of them have the merit, in my opinion, of having nurtured fresh polyhedric perspectives merging the environmental, the political, and the socio-economic. Following, I will explore the opportunities and criticalities of the way environmental justice studies, environmental humanities, and political ecology have adopted the debate related to the risk topics. I will analyse how these fields of knowledge have dealt with the construction of risk knowledge in ways that have unearthed the systemic injustice underpinning environmental issues.

Environmentalism(s) seeking justice

Communities have self-organized in different ways in order to quest for a better quality of life, a better neighborhood, a better environment. As quite fully examined in the literature, the historic roots at the foundation of the environmentalist movements are different from the ones at the origins of the environmental justice movements. The first stems from environmental conservation and protection movements, the second from social justice grassroots movements.

More in detail, in regards to the environmental movements, the studies on the forms of environmentalism are multi-nuanced also because the "green' archipelago" (Diani 1988, 1990) has become quite heterogeneous: a jagged world of associations, committees, parties, and spontaneous groups whose main purpose is the protection of the environment.

On the varied forms of environmentalism in 1999 Ramachandra Guha, one of the foremost thinkers on ecological issues, published "Environmentalism: A Global History": a groundbreaking book on the origins and growth of global environmental thought and action. Sixteen years later finally the Italian edition came out but with a slight change in the title, that is "Ambientalismo. Una Storia Globale dei Movimenti" which translated is "Environmentalisms. A Global History of Movements" (Guha 2016). The added "s" means in Italian "more than one", and, I think, turns the title into a fairer one. In fact, while the environment is one, the manners to protect, interact, and take care of it are diverse and have changed over time. It is not a case if, again Guha together with Martínez Alier talk about "varieties of environmentalism" (1997), Armiero and Sedrez show how the diverse and plural forms of environmentalism have shaped and challenged the dialectical relationship between global and transnational approaches and local struggles (Armiero and Sedrez 2014). Guha (2000,

2016) identifies two main waves of environmentalism, the first wave as an answer to the first industrial revolution, the second wave as an answer to the second industrial revolution. Both waves contain further sub-forms of environmentalism.

To the first wave belong at least two forms of proto-environmentalism. One is the “romantic ecology” inspired by the desire to “come back to the Arcadian nature” that arose as a result of the increasing pollution of big Western cities such as London during the 19th century. The return to rural lifestyle has gained a much more political and material meaning in Gandhi's pacific mobilization. A second proto-environmentalism is the scientific conservatism ideology that has stimulated the birth of the forest science and, above all, the wilderness philosophy that, while it was fortifying the nationalist feeling of being proudly having beautiful American nature, have been enforced not without cases of conflicts and dispossession of native lands (Guha 2016: 64).

The second wave counts many milestones. One of these, needless to say, is the publication “Silent spring” by Rachel Carson (Carson 1962) that is considered to have given life to modern environmentalism. Carson denounced the current, at that time, and potential effects of contamination on the ecosystem and made noticeable the urgent need for an ethical change, far from the spirit of domination and conquest of nature, but instead oriented towards respect for all forms of life and the recognition of our dependence on them. In my view, the use of metonymy that assumes the lens of birds to raise the alarm about a possible dystopian future made of silent springs, turns to be not only a narrative expedient but also a call for a paradigmatic and epistemological shift, i.e. that of "small is big" to comprehend and act in the world.

Despite this, Carson never questioned the economic model that had produced risk, to get which, another masterpiece of environmentalism came a few years later with the publication of “The Closing Circle” by Barry Commoner (Commoner 2020 [1971]). His book is considered the founding work of political environmentalism as it connects the socio-political and productive system with environmental degradation. Commoner's thesis is that every time we produce a commodity we incur a debt to the environment. Industrial development has allowed a part of the planet to take a lot but to give nothing back, no longer closes the natural circle. The effects of this lacking closure are devastating for the health of the planet, but they are equally serious because they are based on social and geographical inequalities.

Carson and Commoner establish the theoretical foundations of the second wave of environmentalism. Since the '60s, in parallel with a global social revolutionary trend, various environmental movements have arisen that have shaken the already existing ones. Guha (2016) talks of the spreading in the Western countries of biospheric egalitarianism looking for deep ecology, of radical pacific approach of Earth First, of institutionalization of environmentalism through the success of German green parties, as well as of the (lack of) environmentalism in what was the second world –the soviet one. Europe has officially embraced environmentalism through the sustainability discourse, mainly based on eco-efficiency. In this regard, in order to orient into these heterogeneous environmentalisms some scholars have defined the following coordinates: identity, modes of action, the type of structure. According to these classes three identity orientations can be

recognized (Montani and Marciano 2012): conservationism that has inspired important battles for the establishment of parks and nature reserves, for the protection of endangered animal species; political ecology that conceives the environmental issue as an opportunity for social transformation; environmentalism that critiques lifestyles, ways of consuming goods, alternatives with which to overcome the crisis of non-renewable resources. The most representative and recent concept of this latter type of environmentalism is "sustainable development". According to Montani and Marciano (2012), the three main modes of action are: conventional, demonstrative, and confrontational, depending on the inclination toward pressure or protest practices. The three types of structures are professional, voluntary, or spontaneous according to the level of bureaucratization they have reached. Klassen and Feldpausch-Parker (2011) have shown how the collaboration between community-based organizations and local NGOs can be beneficial in providing a voice to communities because of their ability to insert themselves within the bureaucracy (i.e., lobbying and litigation) or their ability to work within it (Norton 2007). The fact that the organizational involvement or lack thereof, influences how citizens were involved in decision-making entails the increasing importance of such organization within the subaltern community's struggles. According to Carmin (2003) even if there is virtually no relationship between community action and the presence of active social, cultural, professional, and religious organizations, however, participation and mobilization are likely to emerge in communities where local, national, or international environmental organizations are active. These patterns suggest that specialized NGOs may be instrumental in promoting public participation in local environmental policy and planning processes in states that historically have not had a non-profit sector. While the share from these organizations of organizational and lobbying skills with local subaltern committees is important, the risk emerges when there is not that share or even where there is not an organization. The community organization is less common in European countries, as it has its roots in the American ones. In Europe international organizations such as WWF, and Greenpeace do not exactly reflect the strategies carried out for instance by specialized NGOs. Besides, not always is the so-called "third sector" close to the environmental issues

More recently, between the 90's and the first 2000s, in the US, there emerged a "civic environmentalism" discourse from which in my perspective stems a useful systematization of how civic society engages with environmental issues. Civic environmentalism is the idea that members of a particular geographic and political community should engage in planning and organizing activities to ensure a future that is environmentally healthy and economically and socially vibrant at the local and regional levels. It is based on the notion that environmental quality and economic and social health are mutually constitutive (Shutkin 2000: 14). To embrace a policymaking perspective allows us to refer to civic environmentalism as "using local, collaborative decision-making processes to generate innovative, non-regulatory solutions to a host of environmental problems" Layzer (2002: 2) i.e., in relation to their interaction with both the environment and the administrative institutions. According to Agyeman and Angus (2003: 353), there is a distinction between "narrow-focus" and "broad-focus civic environmentalism". To the first belongs all those movements that stress limits of top-down command and control environmental regulation. Moreover, they focus on the interconnected nature of

environmental problems adopting an ecosystem focus according to which the environmental problems do not correspond to political boundaries. Finally, through a reformist approach they stand for technical advances and more a policy change that incorporates community perspective through procedural justice. Differently, the broad-focus civic environmentalism is an umbrella concept for all those movements that stress the interdependence between nature, social, political, and economic problems. Their aim is to achieve more sustainable communities by both protecting and enhancing the environment while meeting social needs. To accomplish such a vision, technology is not enough; instead, a political transformation seeking to form a paradigm shift is required. Together with procedural justice, a substantive justice stemming from the awareness that environmental justice is a result and cause of social, economic, and racial inequality is needed.

A broad-focus civic environmentalism has been recognized as being far more likely to result in a greater social capital, and a holistic appreciation of the inextricable links between environmental, social, and economic characteristics of sustainable communities (Agyeman and Angus 2003: 345).

The omission of justice or equity from the most frequently used definitions of sustainability is what has been called the “equity deficit” (Taylor 2000). This is connected with the *lacuna* between knowing and acting i.e., “the sustainable gap” (Christie and Warburton 2001) readable on how the vast majority of ecological scientists have not examined the social and political causes of ecological degradation (Taylor 1992). Those gaps lay at the basis of the historical difference between the mainstream narrow-focus environmentalism and the broad-focus one that is able to encompass forms of environmentalisms such as the environmental justice movements. It is not by chance that several scholars (Agyeman 2005; Schlosberg 1999) have called for bringing together sustainability, environmental justice, and equity movements (Agyeman et al. 2002) through movement fusion (Cole and Foster 2001) and cooperative endeavors between proponents of both paradigms so to obtain collaborative and sustainable communities helping complex urban policy and decision-making systems work smarter, while remaining grounded in the will of citizens through the use of increasingly sophisticated deliberation, collaboration, consensus building and conflict resolution tools. Agyeman, Brulle and Evans (2002) have even endeavored to theoretically envision such collaboration between sustainable groups and environmental justice movements through the introduction of “just sustainabilities”.

The lack of social inequality issues lies at the basis of what, in my opinion, represents the trailblazing contribution to the recent environmentalism literature that is the conceptualization and explanation, supported by many empirical cases, of another type of environmentalism, which is the “environmentalism of the poor”. According to its creators, Guha and Martínez Alier, the environmentalism of the poor concentrates the challenge in the south of the world. In fact, in their work, they have not only retraced temporally the history of the environmental movements from the past to nowadays but also “spatially” since they discern a crucial difference between Northern and Southern ways to approach environmental issues (Guha and Martínez Alier

1997; Guha 2000; Martínez Alier 2009 [2004]). Environmental movements in the “poor” (or powerless)⁵⁵ countries of South America developed quite differently from those in the rich white nations of North America and Western Europe asking for parks, eco-efficiency, and rational use of natural resources. Southern movements dismantle the “post-materialist values” of the North, according to which the fight for the environment is a cultural choice that only wealthy people can afford. On the contrary, the environmentalism of the poor in the South is in fact a step ahead of the North because it simultaneously demands environmental and social justice. The environmentalism of the poor is deeply materialistic and connected to livelihood. Not only does it recall attention to the concrete socio-economic problems behind the distributional environmental conflicts, but it also calls for a global merging and collaboration between environmentalism of the poor and environmental justice movements, which are very “materialistic” forms of environmentalism i.e., connected with livelihood.

In order to clarify the peculiarities of the environmentalism of poor, Martínez Alier (2009 [2004]) maintains that can be distinguished three main trends of environmental movements: the cult of wilderness, aforementioned; the gospel of eco-efficiency based on ecological modernization strand (see chapter 1.1), and the environmentalism of poor. All three have differences and similarities. For instance, the first two trends, again, have a much more post-materialistic approach and rely on what has been defined a “scientific environmentalism” that, in other words, grounds mostly on expert knowledge or, at most, on unpoliticized forms of citizen science. On the contrary, the environmentalism of poor is materialistic since the environment is seen as crucial for livelihood and focuses on the emancipatory role played by the local knowledge in order to support community struggles.

The environmentalism of the poor fills the previously mentioned “equity gap”, as well as does the environmental justice movement started in the US and about which I will discuss in the next section. Both approach the environmental issue as intertwined with socio-economic injustice, this is why some wish, and support their coalition for achieving a better future world (Schlosberg 2007).

Succinctly, to look at the environmental movements, scientific environmentalism, and grassroots groups both from a temporal (historical) and spatial (geographic distribution) point of view allows amplifying the concept of risk and comprehending the multi-arrayed manners, modes of actions, and knowledge tools, by which civic society has attempted and managed to deal with risk. This section has unveiled how the environmental discourse and practice have been conceived at length as neutral and apolitical, rather than nestled into the socio-economic structure. This has meant not taking into consideration the socio-ecological interconnections

⁵⁵ I want to stress the difference of meaning between poor and powerless. With the word “poor”, I refer to a state of economic distress that most of the time implies a status of powerlessness too, while with the word “powerless” I mean a status of marginalization that implies an unbalance of power which can include also a status of poverty, but that can occur regardless of the economic status.

shaping, producing, and reproducing the risk landscapes. I argue that the environmental justice movements and studies, as well as the political ecology, have challenged such a lack, as I will explain in the following.

From the roots to the fruits of the environmental justice movements

The environmental justice movements come from another story other than the environmentalism one. Albeit in the early 2000s the term environmental justice began to be applied worldwide, as a matter of fact, the environmental justice movements and studies mainly derive from the United States context.

There are two historic emblematic episodes that, though debated, are recognized as the symbols of the beginning of the environmental justice movement: one coming from the struggle against the toxic waste collocation and disposal; one coming from the quest for racial justice rooted in the civil rights movement. The crucial event of the first strand is the Love Canal case, near Niagara Falls in upstate New York, where in 1978 Lois Gibbs, who was raising her family there, discovered that her home and those of her neighbors were sitting next to 20,000 tons of toxic chemicals. That shocking discovery spurred Lois to lead her community in a three-year struggle to protect their families from the hazardous waste buried in their backyards. By trial and error, Lois and her neighbors developed the strategies and methods to educate and organize the community, assess the impacts of toxic wastes on their health, and challenge corporate and government policies on the dumping of hazardous materials. According to Francesca Rosignoli (Rosignoli 2020), the Love Canal case can be identified as the beginning date because it sparked public opinion sensibility and the perception of toxic waste problems bringing it to the national level. Also, thanks to civic mobilization, the case of contamination was not treated as isolated, instead, as in relation to a wider toxic network, confirming what was anticipated by Beck (1992) when arguing that the uncertain nexus between science and risk, action and inaction, would have made pollution a highly politicized concept, with occasionally harmful and contested consequences.

However, most academics and activists trace the beginning of the environmental justice movement to another date which is 1982, when a protest took place against the dumping of PCB-laden dirt in a new hazardous waste landfill in Warren County, North Carolina. Warren county was not only one of the poorest counties in North Carolina but also had a population that was 65 percent African-American and yet it was chosen to receive this statewide waste. As a response to this, civil rights and environmental groups worked together and, despite not winning the battle to stop the construction of the waste dump, they continued to work on the interplay between racial and environmental issues until the publication in 1987 of a first “gospel of environmental justice” which is the publication “Toxic Wastes and Race” (1987) by the United Church of Christ. Benjamin Chavis, the executive director of the Commission for Racial Justice of the United Church of Christ, first coined and defined the term environmental racism in the following manner: “Environmental racism is racial discrimination in environmental policymaking, the enforcement of regulations and laws, the deliberate targeting of communities of color for toxic waste facilities, the official sanctioning of the life-threatening presence of poisons and

pollutants in our communities, and the history of excluding people of color from the leadership of the ecology movements” (Bryant 1995: 6). This document has unmasked the unequal and discriminatory siting of toxic waste facilities across the United States in distressed black neighborhoods, indicating how race was the most important factor in predicting where these waste sites would be located. Since then several scholars have studied and deepened the diverse forms of injustice. For instance, it has found little evidence to indicate that disparities in facility siting began before 1970, instead such disparities increased significantly during the 1970s and 1980s. This phenomenon could be the consequence of rising public concerns about environmental hazards during this period, especially about hazardous wastes after the enormous publicity given the Love Canal crisis in the late 1970s, and the greater success of white communities at keeping noxious land uses from being sited in their neighborhoods. As a result of this success, locally unwanted land uses (LULUs) became increasingly diverted to politically more vulnerable low-income and people of color communities, corroborating Bullard and Wright’s (1987) earlier argument that “not in my backyard” (NIMBY) increasingly became “place in blacks’ backyards” (PIBBY). This further confirms how the geographies of environmental injustice followed those of consolidated racial discrimination (Mohai and Saha 2007; Mohai et al. 2009).

In summary, the quest for socio-economic justice characterizes particularly the environmental justice movements that are composed of people from communities of color, indigenous communities, and working-class communities who are focused on combating environmental injustice and for whom social justice is inseparable from environmental protection (Pellow 2016: 222).

Since those two triggering events, many communities have self-organized against injustices in their own territories and have been increasingly examined, and in a few cases supported by researchers, especially coming from the field of sociology of environment. From this action, research and scientific production, several definitions and declinations of environmental justice have emerged. I will briefly present a few core concepts: environmental racism; environmental justice; environmental equity (or injustice).

Often described as an example of environmental injustice, as a specific form of environmental inequality or as an extension of racism (Bryant 1995), environmental racism focuses on the disproportionate impact of environmental hazards on communities of color and on the recognition of those communities. According to Bryant (1995) “environmental racism “refers to any policy, practice, or directive that differentially affects or disadvantages (whether intended or unintended) individuals, groups, or communities based on race or color”. Furthermore, it regards those institutions, rules, regulations, and policies of the government or corporate decisions that deliberately target certain communities for least desirable land uses. The consequence of this is both the disproportionate exposure of toxic and hazardous waste on communities based upon prescribed measures and the systematic exclusion of people of color from decisions affecting their communities (Bryant 1995: 6).

Environmental justice has been defined as “an effort to analyze and overcome the power structures that have traditionally thwarted environmental reforms and is defined as the fair treatment and meaningful involvement

of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies” (Environmental Justice journal web page 2008). According to David Pellow (2009), to frame environmental justice as a mere ecological problem runs the risk of missing the point that ecological violence is first and foremost a form of social violence, driven by and legitimated by social structures and discourses. For instance, frequently in his works Pellow (2009: 3) points out that the problems of environmental racism/inequality are not fundamentally environmental issues; they are social problems”. This is linked with another definition of environmental justice as the principle that “all people and communities are entitled to equal protection of environmental and public health laws and regulations.” (Bullard 1996: 493). In a 1999 interview, Bullard described how “The environmental justice movement has basically redefined what environmentalism is all about. It basically says that the environment is everything: where we live, work, play, go to school, as well as the physical and natural world. And so we can’t separate the physical environment from the cultural environment. We have to talk about making sure that justice is integrated throughout all of the stuff that we do”. Environmental justice refers to those cultural norms and values, rules, regulations, behaviors, policies and decisions to support sustainable communities where people can interact with confidence that the environment is safe, nurturing and productive. Focused on ameliorating potentially life-threatening conditions or on improving the overall quality of life for the poor and/or people of color, environmental justice is based on problem-solving (Pellow 2000). Struggles for environmental justice “are embedded in the larger struggle against oppression and dehumanization that exists in the larger society” (Pulido 1996: 25).

Environmental injustice or inequality refers to a situation in which a specific social group is disproportionately affected by environmental hazards. Environmental inequality focuses on the broader dimension of the intersection between environmental quality and social hierarchies and addresses more structural questions that focus on social inequality –i.e. the unequal distribution of power and resources in society- and environmental burdens. After all, and perfectly in line with this, Beck acknowledges the inverse relationship between wealth and living in polluted spaces—which is the fundamental basis for the environmental inequality thesis, that toxic industry and other sites of ecological harm tend to be collocated with communities of color and other vulnerable populations. Environmental inequalities are not always simply imposed unilaterally by one class of people on another. Rather, like all forms of stratification, “environmental inequalities are relationships that are constituted through a process of continuous change that involves negotiation and often conflict among multiple stakeholders” (Pellow 2000: 589).

Pellow (2000) proposed an environmental inequalities formation that emphasizes the linkages through three major points, which are: a) the need to redefine environmental inequality as a socio-historical process rather than simply viewing it as a discrete event; b) the need to understand that environmental inequality involves multiple stakeholder groups with contradictory and shifting interests and allegiances; c) viewing the ecology of hazardous production and consumption through life-cycle analysis.

These core-concepts have been shaped during the development of the environmental justice movements over the years. According to Francesca Rosignoli (2020: 48) there are three main phases of the environmental justice movements: environmental racism; environmental equity movement; environmental justice movement.

The environmental racism movement grounds on the awareness that race is a social construct and mechanism of classification that has historically defined and continues to shape the distribution of power, privilege, and economic resources in American society. It represents the “negative phase” regarding the struggles due to environmental inequalities. In this phase, the focus is to prove empirically the existence of an unequal distribution of dangerous disposals and burdens also by means of community experiences of “popular epidemiology” (Brown 1992). These empirical researches have given scientific legitimization to the movement for environmental justice and provide a theoretical frame to link civil rights struggles with the new experiences of environmental activism. This phase has also produced the evidence that some zones are conceived as expendable but also first reflections on how the market plays a crucial role in producing and reproducing environmental inequality (Mohai and Bryant 1992). The main treated issue has been a distributional one, i.e. concerning the connections between socio-economic-health inequalities and the distribution of industrial facilities (Chakraborty and Basu 2018; Walker et al. 2007; Daniels and Friedman 1999), dumps, and waste disposals (Baabereyir et al. 2012; Martuzzi et al 2010; Mohai and Saha 2007). As Pellow (2002) well summarizes, in this phase the environmental justice movements had been very clear about what they were fighting against and much less for what they were doing. The main milestones of this phase have been the Conference on Race and the Incidence of Environmental Hazards at the University of Michigan in 1990, having a specific focus on the racial and socioeconomic disparities in the distribution of environmental contaminants and whose proceedings have stimulated a flourishing dialogue with the EPA that leads to the creation within the EPA of an Office of Environmental Equity, later renamed the Office of Environmental Justice. Another milestone is the organization of the First National People of Color Environmental Leadership Summit, held October 24–27, 1991, during which seventeen principles of environmental justice were adopted. A masterpiece of this phase is the now classic book written by the sociologist Bullard “Dumping in Dixie” (1990) that was the first major study of environmental racism linking hazardous facility siting with historical patterns of spatial segregation. Bullard found that communities of color were being deliberately targeted for the location of society’s unwanted waste and that these practices had their origins in both historic and contemporary forms of institutional racism.

The Environmental Equity Movement enlarges the focus on the racial issue by including the struggles for civil rights, social, and gender discrimination. The final purpose of environmental equity is improving the quality of life for everyone and to ensure/guarantee protection from environmental risk through environmental laws.

Finally, the environmental justice movement phase condenses the most institutional phase on the basis of the emerging paradigm of environmental justice, intentionally merging the ecological question with social and working issues. It is more prone to the “positive moment”, i.e. to those environmental justice actions and

environmental policies that should be enforced in order to create sustainable communities. A more recent and institutionalized result of the idea that environmental justice should not only be reactive to environmental bads but it should also be proactive in the distribution and achievement of environmental goods by creating sustainable communities with a higher quality of life (Agyeman 2005: 26), is the current vivid discussion, both among activists and politics of the Green New Deal.

In short, notwithstanding the environmental justice movement, and its correlated concepts, mainly derives from the American context, however, I believe that they have contributed to unveil and underline the interconnections between socio-economic dynamics and the environment: a lesson that is enlightening and applicable in many other contexts worldwide.

Trespassing environmental (justice) studies

The Love Canal and Warren County cases have drawn attention to the maldistribution of burden and risk and health inequalities according to socio-economic and racial characteristics. Since then, how I summarized them in the previous paragraph, activists and academics have elaborated on new concepts, while the environmental justice movements were changing and taking shape. A specific field of knowledge, environmental justice studies, spreads and spawns several studies both on the socio-environmental injustice permeating the territories and on the community's reactions. More recently, other fields of knowledge started to get close and scrutinize these themes, such as political ecology and the environmental humanities.

Pellow recognizes two main phases of environmental justice studies. The “first-generation,” was focused primarily on documenting environmental inequality through the lens of race and class. For instance, comparisons between case studies have unearthed the connections between the socio-economic-health status of residents and the localization of risk coming from industrial facilities, mines and dumps to the detriment of powerless communities⁵⁶. Hundreds of studies have documented that people of color, people of lower socioeconomic status, indigenous and immigrant populations, and other marginalized communities are disproportionately affected by ecologically harmful infrastructures, such as landfills, mines, incinerators, polluting factories, and destructive transportation systems, as well as by the negative consequences of ecologically harmful practices, such as climate change/disruption and pesticide exposure (Ringquist 2005).

The “second-generation” studies extend beyond questions of distribution to incorporate a deeper consideration of theory and the ways that gender, sexuality, and other categories of difference shape environmental justice struggles (Buckingham and Kulcur 2010; Walker 2010). Regarding this latter generation, Pellow maintains that there is a trend to go toward critical environmental justice (CEJ) studies mainly characterized by the ways

⁵⁶ John Gaventa (1980) explains the quiescence of powerless communities as the result of a situation of glaring inequality, in which any rebellions have been suppressed over time.

that gender, sexuality, citizenship, indigeneity, and nation shape the terrain of eco-logical inequalities (Pellow 2016, 2018). Pellow and Brulle (2005) and has coined the term CEJ studies” in order to expand the field towards multiple social categories of difference such as race, gender, sexuality, ability, and class, and furthermore to species, to attend to the ways in which both the human and the more-than-human world are impacted by and respond to environmental injustice (Pellow 2016: 223).

CEJ is a perspective intended to address a number of limitations and tensions within environmental justice studies by means of four pillars. The first pillar calls for paying attention to how multiple social categories of difference are entangled in the production of, and in challenge to, environmental injustice, including race, gender, sexuality, ability, class, and species. This means to emphasize intersectionality⁵⁷ with the goal of explaining the ways that many identities and social categories work together to produce advantages and disadvantages across bodies and space (Pellow 2016: 225). This pillar calls for recognizing that inequality and oppression in all forms intersect and involve assemblages of humans and more than humans. This entails also that while the actors in the more-than-human world are subjects of oppression and frequently, agents of social changes, and thus, the urban environment can be understood as socio-natures, i.e., a nature/culture hybrid (Pellow 2018: 20).

The second pillar embraces multi-scale methodological and theoretical approaches to studying EJ issues in order to build a more substantive grasp of the complex spatial and temporal causes, consequences, and possible resolutions of EJ struggles. CEJ studies look for multi-scalar methodological and theoretical approaches in order to better comprehend the complex spatial –from micro to macro- and temporal –past, present, future- causes, consequences, and possible resolutions of EJ struggles (Pellow 2018).

The third pillar regards the relation with the State⁵⁸ and suggests that transformative analyses and visions of environmental justice might seek to function beyond the state, capital, and the human through a broad anti-authoritarian perspective. In his view, EJ and other social movements would be best-off articulating, developing, and supporting practices, relationships, and institutions that deepen direct democracy toward a more robust democracy.

Finally, the fourth pillar of critical environmental justice builds on the viewpoint that all humans and more-than-human actors are indispensable for the present and for building sustainable and just resilient futures. Excluded, marginalized, and “othered” populations, beings, and things –both human and more-than-human– must be viewed not as expendable but rather as indispensable to our collective futures (Pellow 2018). Indispensability is the mirroring concept which Márquez (2013) has called “racial expendability,” referring to

⁵⁷ About intersectionality, which is the fact that race, class, gender, and other social categories are always linked in the experiences of individuals and groups (Crenshaw 1994).

⁵⁸ David Purucker (2021: 6) has criticized Pellow’s position in respect to the State, accusing him to “withdraw from engagement to the greatest extent possible, in a kind of eco-separatism beyond the state”.

the fact that some people and bodies are undervalued and not worthy to be protected. According to Armiero (2019), the concept of expandability can be linked to what Bauman wrote on wasted lives: “To be ‘redundant’ means to be supernumerary, unneeded, of no use—whatever the needs and uses are that set the standard of usefulness and indispensability” (Bauman 2017: 12). Both Pellow and Bauman unveil that this expendability is built on a radical “otherness” that hides the deep connections between “what is seen as pointless and what is not” (Armiero 2019: 116). The practice of “othering,” which is inherent to the colonial project, rests at the heart of any wasting relationship shaping what Marco Armiero defined as “wasteocene” (Armiero 2021). The production of waste is connected to the production of other, or the outside, and of the “us.” “We might say that “othering,” that is, the colonial production of the other, and “saming,” that is, the rhetorical invention of the “us,” are two sides of the same coin” (Armiero 2021: 2).

In short, CEJ seeks to encompass and dialogue with these small and growing groups of researchers –including and especially environmental humanities scholars- have focused on the ways that gender, sexuality, citizenship, indigeneity, and nation shape the terrain of ecological inequalities.

For instance, the first pillar is very much connected with an increasing field of studies into the environmental humanities, interrogating the features, role, and agency of the nonhuman in its relationship with humans, as well as investigating the “ecological reflexivity”, i.e. problematic effects of modernity on the nonhuman world (Schlosberg 2007: 189). The acknowledgment that human beings are inescapably part of a larger ecosystem has been, for instance, at the center of the ecological history of disease in the US (Nash 2006). It can also be found in Haraway's concept of companion species with which "making kin" and feeding "symbiosis", i.e. interspecies bonds, that are mutually beneficial (Haraway 2016, 2016). As well as into the groundbreaking field of multispecies studies aimed to show, often creatively, how the organic world and its inorganic parts are a single system whereby each part is linked to each other part and how what gives us life on earth are actually the interspecies interdependencies.

Drawing on a more "material feminist approach", Alaimo focuses on trans-corporeality, or movement across bodies and nature, to show how powerful and pervasive material forces have increasingly harmful effects on the human body that has profoundly altered our sense of self. Imaging human corporeality as trans-corporeality, in which the human is always intermeshed with the more-than-human world, underlines the extent to which the substance of the human is ultimately inseparable from “the environment.” It makes it difficult to pose nature as a mere background (Alaimo 2010: 2). Rather than just a natural/biological fact, other scholars have shed light on whether the body is at the center of alternative understandings of the history of the human/nature relationship. Barca re-reads working-class environmentalism through the workers’ (bodily) knowledge of industrial hazards and the ways in which this could translate into political action beyond (and

even possibly against) that of labor organizations. She highlights how an “embodied environmental history” (Barca 2012) is needed in order to “tell the right story” and to create a “narrative of liberation” (Barca 2014)⁵⁹.

Body turns out to be physically the space where people experience the oppression of capitalist relations and the opportunity for building resisting communities (Armiero and De Rosa 2017: 174). Scholars, especially from the environmental humanities field, have argued how the body embeds knowledge and can be a lens through which it discloses the socio-economic transformations. Through the sense of the body it is possible to unveil the landscapes of injustice. As Armiero and De Rosa have argued (2017: 183), sensing can be a fundamental tool of “researching the bodily understanding of politics”. In their case from Campania they demonstrate the relevance of sense for the politicization of people. In order to “bodily” catch such changes, not only does noise play a central role in tracing the smellscape of injustice, but also the sense in broader acceptance becomes a fundamental tool of research. Sense can detect the penetration of capitalist relations in the body (Armiero and De Rosa 2017: 174). In addition to producing knowledge through its sensorial interpretative skills, the body, when ill and/or toxified by contamination, often becomes the first place of politicization, or subjectivization. As a consequence, in environmental justice struggles, the body can be politicized (Iengo and Armiero 2017) i.e., converted into an “arena of conflict” (Armiero and Fava 2016: 79). The injured biology of a population has laid at the basis for social membership and staking claims to what has been defined as a “biological citizenship” i.e., a demand for, but limited access to, a form of social welfare based on medical, scientific, and legal criteria that recognizes injury compensation (Petryna 2004). Similarly, the political and scientific potentialities of the body in the health social movements have been explored and theorized by Brown (2007) and Brown et al. (2004) in the elaboration of the embodied health social movements that are those social movements organized around health-related issues that seek to address disability or illness by challenging science on etiology, diagnosis, treatment, and prevention. These movements also include “contested illnesses” (Brown 2007; Brown et al. 2012) that are either unexplained by current medical knowledge or have purported environmental explanations that are often disputed. As a result of this, these groups organize to achieve medical recognition, treatment, and/or research. They represent hybrid movements that blur the boundaries between lay and expert forms of knowledge and between activists and the State (Brown et al. 2004); this is why they have been defined as “boundary movements” applying strategies that involve citizen/science and generate alliances to contend with environmentally related illnesses. A central vehicle for blurring these boundaries is the use of the “citizen/science alliance,” a lay-professional collaboration in which citizens and scientists work together on issues identified by laypeople. The interaction among boundary movement organizations and groups is made possible by the fluidity with which these groups can move back

⁵⁹ “The ‘liberation narratives’ are counter-hegemonic and are instrumental to the construction of alternative regimes of truth and to the legitimation of an alternative knowledge to that which pervades the structures of power and injustice. They are counter-narratives of resistance to environmental destruction that can be found in individual and collective memories, in the self-representations of social movements, and in other forms of creative expression relating to issues of environmental (in) justice” (Barca 2014: 9).

and forth between organizational cultures and between the roles of activists and experts. Empowerment and politicization for movement activists often involve utilizing knowledge of individual environmental exposures to inform science. In this process, both social-movement actors and scientists are boundary actors crossing into a new world to advance social-movement claims. According to Brown et al. (2004) the boundary movement has influenced the production of science and policy by beginning to produce a new public paradigm that informs the scientific study of women's health issues and the creation of environmental policy. This introduction of values into a supposedly value-neutral world has the potential to overcome the disconnection between environment and health, and influence the methods through which health is generally researched. The peculiar characteristic of such movements is that they introduce the biological body to social movements in central ways, especially in terms of the embodied experience of people. The participants of these movements have arrived at their activism through a direct, felt experience of illness. In other words, the individual women's experiences are converted into a politicized collective illness identity by, therefore, transforming a personal problem into a public, political and scientific agenda (McCormick et al. 2003; Iengo and Armiero 2017). According to Porto et al. (2017) health is intrinsically tied to the capacity of affected communities and their democratic allies to face environmental conflicts, for these reasons they propose a comprehensive vision of health that relates not only to illness and death but also to life, nature, culture, and fundamental human rights. Health as dignity, in their proposal, entails and entrains a political epistemology according to which, the way knowledge is produced plays a fundamental role in environmental justice mobilizations since issues of power are related to epistemological disputes and counter-hegemonic alternatives.

If, as Brulle argues (2000: 208-209) "...the discourse of environmental justice sees the use of scientific experts as part of a system of oppression and domination...", it is also true that environmental justice movements have attempted to unsettle such oppression by experimenting with the co-construction of counter-knowledge. An emblematic example in this regard is the popular epidemiology that is "...the process by which laypersons gather data and direct and marshal the knowledge and resources of experts in order to understand the epidemiology of the disease, treat existing and prevent future disease, and remove the responsible environmental contaminants." (Brown 1992: 267). Being inspired by a detailed study on a childhood leukemia cluster in Woburn, Massachusetts, Brown et al. (2004) maintains that community groups using popular epidemiology have successfully challenged and changed the nature of scientific inquiry and bridged lay and professional ways of knowing. It is no coincidence that popular knowledge has been recognized as a practical example of an extended peer community displaying important aspects of post-normal science, namely, the struggle for legitimacy by nontraditional researchers (Funtowicz and Ravetz 1992: 269). However, Pellow (2003) has intercepted both the costs and benefits of popular epidemiology, i.e., the empowering and disempowering of social movement organizations.

Body, senses, physical perception, and personal experience are, simultaneously, important motivating factors in some people in order to become activists and "extended facts" that enrich, sometimes rebut or debunk, cognitively the expert knowledge about risk. For this reason, political ecology, environmental humanities, and

justice scholars exhort the decolonization of methodologies trying to scrutinize the generative intersections amongst place, body, mind, and spirit so as to look for voices beyond conventional texts and archives. This effort, for instance, has given space to the development and experimentation of walking interviews i.e., data generated through interviews made during tours and that, consequently, are profoundly informed by the landscapes in which they take place, emphasizing the importance of environmental features in shaping discussions. Evan and Jones (2011) have demonstrated a measurable difference between walking and sedentary techniques in the production of rich place narratives both in terms of their quantity and spatial specificity to the study area. Other cognitive tools have been the toxic tours that are experimental community-led explorations of toxic places that appeal to the intellectual, sensorial, and emotional understandings of what physically daily living means in a toxic place. Toxic tours empower local people, recognizing their knowledge, and build connections and solidarities to support local struggles. Senses and body as a way to construct in a collective way a politicized knowledge lays at the basis of the autobiographies that have played a crucial role in the making of the environmental justice movement, exposing the “visible industrial modernity’s hazardous dustheap” (Foote and Mazzolini 2012: 23). At the junction between environmental humanities, environmental justice studies, and political ecology there are the toxic autobiographies⁶⁰ i.e., stories produced by people who have encountered contamination during their lives (Armiero et al. 2019a). These autobiographies regard the everyday relationship between human and non-human bodies with contamination (stench, pollution, waste, diffuse illnesses, and devastated landscapes) and seek to co-produce a counter-hegemonic narrative. Although directly connected to oral history practice, toxic autobiographies slightly differ from it. They assume the centrality of the body and the bodily experience in understanding the world and the place of the storyteller in it; they are clearly placed in opposition to what have been called “toxic narratives” (Wu Ming 2011) and “narrative violence” (Barca 2014). The latter aims to contaminate public discourse by imposing official truths while dismissing any alternative point of view i.e., silencing and normalizing injustice. Instead, toxic autobiographies fight to make it visible, transforming an individual experience into a collective cry for justice. Finally, as I maintained previously, toxic autobiographies can unfold the patent and invisible forms of extractivism (Privitera 2021a) as well as the “landscapes of the Wasteocene” (Armiero et al. forthcoming).

The types of mobilization so far cited regard collective actions that have been carried out in order to respond to the feeling of injustice perpetrated by top-down choices by corporations or by the State. Hence, they are examples of individual dramas that have flown into collective reactions.

Nonetheless, it is not always like this. In fact, it is worth noting that in some cases, there is not that reaction, instead, there is quiescence (Gaventa 1980: 4) through the maintenance of power relationships. Sometimes, behind quietance there are forms of “resigned activism” (Lora-Wainwright 2017) that are tempered by

⁶⁰ The Toxic Bios is a public environmental humanities project that aims to co-produce, gather, and make visible stories of contamination and resistance (Armiero et al. 2019). Website: <http://www.toxicbios.eu>

resignation since local communities feel powerless and often come to accept pollution as part of the environment. Not such resigned but still small reactions have been depicted “intimate activism” that, according to Tironi (2018: 438) are those “ethical and political affordances of the subdued doings and engagements deployed through ‘hypo-interventions’”, i.e. through the minimal and unspectacular yet life-enabling practices of caring, cleaning and healing the ailments of their significant others, human and otherwise. Similarly, “minor enfeebling encounters (...) that stir ethical consideration and potential intervention” (Shapiro 2015: 369) that stir no one, do not produce events or controversies, but that produce ethical relations (Liboiron et al. 2018). The silent environmentalism can be sublimated in the action of daily care (Tironi 2018). All these forms of “intimate activism” are all but unusual and can be found in many communities dealing with chronic environmental contaminants who do not unite in opposition (Brown and Mikkelsen 1990; Couch and Kroll-Smith 1994; Wisaeth 1994), rather, respond in a fragmented way that may include individual acceptance, action, and conflict (McGee 1999).

It is worth pointing out that the damage to one's existential manifestations is even more difficult to recognize in those contexts in which the socio-economic and environmental transformations have occurred in a slow and diffused way over time and space, as for instance in contaminated landscapes. In such contexts, people can develop their own belief systems about nature and the resulting threat of contamination as part of the coping process (Vyner, 1988). In any case, the toxic routine and the addiction to living together with a clear source of risks makes it difficult to discern and overcome the ambivalence with respect to issues of industry (Saitta 2009: 161).

In this regard, Greg Bankoff (2009: 265) argues that when the category of disaster cannot be mobilized to define extraordinary “events” because they entail slow, continual, and often latent “processes,” such as industrial pollution, the result may be what he terms as the “normalization of threat.” These kinds of chronic, everyday disasters are more likely to remain suspended in uncertainty: an uncertainty surrounding not only their underlying causes but also their long-term, not clearly eventful effects. Indeed, constant exposure to adversity makes it harder for people to recognize the state of vulnerability their local communities are exposed to, driving them to resort to categories of invisible forces, neglect, and denial to define their daily experiences of the disaster. Just as the temporally distant character of the damage makes it difficult to assign legal liability, the rationed-out effects of everyday industrial pollution shift people’s perceptions of risk to the dimension of the “ordinary,” denying disaster the status of eventness.

Toxic pollution, species loss, and climate change are the silent killers of our age, yet the casualties of such drawn-out emergencies appear geographically and temporally remote. For this reason, Thomas Davies (2019: 2) suggests that researchers (he says “geographers”) should take up the challenge of “closing the distance between cause and effect”, and narrating the *longue duree* of dispersed environmental harm. For those who live in the midst of toxic geographies and polluted landscapes, “everyday exposure” (Wiebe 2016) to the

accumulations of slow violence is not necessarily a “formless threat” but can be a very real and often tangible brutality.

Consistently, in my opinion, with the idea that the power is not always public, but “at its most effective when least observable” (Lukes 2005), Nixon (2011:2) has envisioned the concept of “slow violence” to describe the violence that “occurs gradually and out of sight, a violence of delayed destruction that is dispersed across time and space, an attritional violence that is typically not viewed as violence at all”. The slow violence is a useful theoretical tool to read all those transformations occurring slowly in time and has spawned certain scientific reflections supported by numerous empirical cases.

Sandlos (2016) has unfolded how the slow violence lens allows understanding how the landscapes of exposure and of dispossession are intersected with the geographies of social inequalities by taking into consideration the time scale. Especially, by looking at the long-term broad-scale impact it is possible to read both the toxic legacies from the past as well as the pollution that will be left to the future generation. The effects of permanent pollution are not merely historical but extend to the potentially far-distant future. Interventions on the questions of “perpetual care” and communicating with future generations expanded otherwise banal projections of “future land use” at the remediated site into a complex and thorny discussion of how to both commemorate the past and represent the toxicity of the site through time (Sandlos 2016). Furthermore, the casualties of slow violence—human and environmental—are the casualties most likely not to be seen, not to be counted. Casualties of slow violence become lightweight, disposable casualties. A follow-up re-signification comes from Davies who argues that an emphasis on the invisible characteristics of pollution risks may produce a downplay of the political agency of frontline communities. In fact, it may be myopic to the many mechanisms, embodiments, and formations of informal knowledge that allow communities to recognize and live with pollution. In his view, slow violence is not necessarily ‘out of sight’ (Nixon 2011: 2) to the people it impacts, but can instead be made knowable through what he terms ‘slow observations’ (Davies 2018: 1549). For this reason, Davies, as I do, maintain that inhabitants of landscapes that have been subjected to slow violence can be better placed than anyone to see the brutal ramifications of pollution gradually unfold (Davies 2019: 11). While other scholars coming from EJ studies have given prominence to the crucial role of activist-researcher⁶¹ in applying “active narrative approach”⁶² and incited the creation of “communiversities” (Pellow 2003), Davies

⁶¹ According to David Pellow (2003) one path sociologists can take to becoming “critical inquirers” (Weinberg 1994) is to become active participants in social movement infrastructures.

⁶² “Active narrative” approach, draws heavily from Weinberg's (1994) concept of a 'sociological narrative, as well as from research on history as story-telling (Cronon 1992), Black feminist theory (Collins 1991; Crenshaw 1993), and advocacy research (Park and Pellow 1996; Stoecker and Beckwith 1992; Stoecker 1996).

has the merit to question the role of researchers in recognizing and enabling forms of insurgent knowledge in the context of slow violence.

In short, environmental justice studies have gone through several development steps and disentangled the multi-faces of socio-economic, health, and environmental inequalities. They have done this by looking at in-depth case studies or through comparative approaches. The EJ studies researchers have been observers or activist researchers and have given space to both lay knowledge and how activists construct emancipatory knowledge (e.g., popular epidemiology, toxic tours, etc.). In my perspective, their weak point is having less questioned the epistemological attitude of scholars, above all concerning all those forms of injustice and violence occurring slowly over time and diffused over space. On the other side, the Environmental Humanities have been so far a groundbreaking umbrella field that was able to carry out “a counter-hegemonic project especially in research and writing practices, less on the level of politicization of the scientific agenda” (Armiero 2020: 30), yet the latter has been the core of political ecology.

Toward interdisciplinary: bring back justice and the political into the environment, and vice versa

In addition to environmental justice studies and environmental humanities, political ecology (PE) has also provided insightful studies and reflections on our current risk society embracing the view of frontline communities. PE is an emerging supra-disciplinary approach, or rather defined “a community of practices” (Robbins 2019: 20) or a “common arena” (Armiero 2020: 27) where scholars having different backgrounds meet to study human-environment interactions with a critical lens. In general, it is focused on how power inequalities relate to environmental changes, and to the distribution of the costs and benefits resulting from such changes. Likewise, environmental justice studies and political ecology have scrutinized the exposure of people to environmental harms, like pollution, infrastructural damage, livelihood destruction, or disease, but also a withdrawal of these issues from the political space.

Despite these disciplinary interplays, political ecology distinguishes itself for having as a central feature the politicization of environmental problems. This means that environmental problems are seen as problems of distribution and the exercise of political and economic power, marked by conflicts over alternative futures and by clashes between alternative values and imaginaries. In the PE view, a real democracy must involve political conflict for redistributing power and for ensuring the control of the economy from below. The environmental conflicts coming from biological losses, socio-economic damages, and health risks are therefore, political, economic, and democratic issues.

PE has the merit of having scrutinized, mapped, and made known several cases of environmental conflicts through cognitive tools, of which a quite emblematic example is the environmental justice atlas⁶³.

When environmental impacts do not give rise to a concrete social response, PE scholars have analyzed the reasons underlying the absence of social protest. As a matter of fact, the contribution of PE regards not only environmental conflicts that have already manifested, but also the identification of latent conflicts and potential strategies to overcome them (Beltran et al. 2015).

PE has unearthed the different forms of extractivism: literal extractivism and extractivism understood as a model of society. The first touches and alters the metabolic cycles underlying the human-ecosystem relationship and consists in the physical and systematic subtraction of resources by private, state, and financial interests to the detriment of local communities and the environment on which they depend. The second interprets extractivism as a model of society (Zibechi 2016) in which all the processes of expropriation, and ecosystemic and social devastation are part of the accumulation mechanism for dispossession of typical financial capital (Harvey 2004). In this case, extractivism, conceived as the indispensable piece to ensure the constant economic growth required by today's dominant global capitalism, can be effectively summarized in the syllogism: without growth, capital does not accumulate; to grow, it is necessary to extract, so we extract! As a consequence, within PE, there has emerged an increasing interest in decolonizing and unmaking the capitalistic imaginaries through the concept of degrowth (Feola 2019).

Hence, PE has focused primarily on how social forms of power transform the environment and, more recently, on how the non-human becomes actively enrolled in processes of uneven and combined socio-ecological production and reproduction. In this regard, Ernstson and Swyngedouw (2019) call for a political project that fully endorses cyborgian human/non-human entanglements and takes responsibility for their nurturing while insisting on the egalitarian presumption that undergirds any democratizing project. The central question, therefore, is no longer about bringing environmental issues into the domain of politics as has often been the case until now, but how to bring the political into the environment.

Furthermore, PE has been critically and politically engaged in investigating and blurring the divide environment-urban by giving birth to the sub-field of urban political ecology. Standing against mainstream techno-managerial renderings –according to which "ecology" is "natural" and "the urban" is essentially "social" and devoid of material agency and biophysical vibrancy- the urban PE provided ways to comprehend "the urbanization of nature" as an inherently socio-material and hybrid form of metabolism, whereby social categories such as capital, money, norms, gender, and race are intimately interlinked with material assemblages as in the built environment, urban green spaces, or flows of water, food, energy, and other non-human matter.

⁶³ <https://ejatlas.org/>

PE not only politicizes the environment (including the urban environment) but also the way the knowledge about environmental risk is constructed. According to PE scholars, expert knowledge and policy decisions are never neutral, but always political (Beltran et al. 2015). PE has unmasked and criticized the post-political strategies, procedures, and techno-managerial arrangements that suspend, colonize, or ignore the dimension of the political system in treating environmental issues (Ernstson and Swyngedouw 2019).

As an alternative to this techno-driven knowledge, PE scholars maintain the importance of "bringing back the political" to the environment (Ernstson and Swyngedouw 2019) and to the construction of knowledge about environmental risk.

As a matter of fact, since PE mainly originated outside academia, as a militant form of knowledge, with the aim to change the world rather than just understand it (Beltran et al. 2015), it is its intrinsic characteristic to mix up research and action. For instance, PE scholars have published kinds of politically engaged guides or roadmaps of "Political Ecology for Civil Society" (Beltran et al. 2015), or have focused on reviewing a set of concepts of political ecology that have been produced by civil society organizations and often by one specific form of NGO belonging to the environmental justice organizations that are leading the global environmental justice movement (Martínez Alier et al. 2014). PE has dug into the thorny issue of the relationship between theory and practice attempting to envision and experiment with ways to engage more explicitly with the pressing question of how to organize anew the articulation between emancipatory theory and political activism (Ernstson and Swyngedouw 2019).

Within the purpose of reopening a space where emancipatory politics and new concepts and practices of citizenship once more become thinkable and do-able. In this regard, Kaika makes a case for a "scholarship of presence" (2019). Scholarship of presence, instead of being obsessed with the concept of the Anthropocene, takes seriously emerging practices and alternative radical imaginaries that demand or enact socio-environmental change. Her scholarship of presence, thence, engages with emerging everyday socio-political practices that try to disrupt the power landscape and resist the forces that continue to dominate the human and non-human inhabitants of the Earth.

To be engaged in forms of co-researching means to participate in giving weight and "ontological gravitas" to emergent and radically emancipatory master-narratives (Kaika 2019), so doing being consistent with those who practice political ecology and care deeply about intervening in the world with the difficulties that most also seem to encounter in practicing activism (Perreault et al. 2015). Doing political ecology requires "being attendant to activist practices"; it is a "symbiotic" relationship of mutual learning and reinforcement where political ecology can inform activism and activism can inform political ecology.

In my view, a groundbreaking call in favor of a "militant science" (Barca 2012: 126) in which researchers are engaged together with the grassroots movements and groups involved in the conflicts can be found in the minifesto "undisciplining political ecology" (Armiero et al. 2019 b).

With this “act of declaration” Armiero, Barca and Velicu (2019) say “No” to discipline that has the ambition to discipline knowledge, people and the world out there. Academics are disciplined to know the world through disciplined knowledge. In other words, it is not only knowledge that is ordered following the logic of disciplinary cataloging but it is the object of study that is in turn cataloged, classified, and above all separated from the rest. Instead of looking for undisciplined ‘models’ –i.e., trying to discipline undisciplined– being undisciplined is a call to reflect on how to escape an academic canon. Being undisciplined can also include various declinations such as multi/trans/interdisciplinary but does not coincide with these. Instead, it means questioning the multiple limits of the disciplines to which they belong, their often patriarchal, racist, colonial, speciesist, classist, ableist, and heteronormative character. To this end, a “gymnastics” of disobedience must be practiced.

Armiero (2021) identifies four different manners of being undisciplined: mannerist, methodological, experimental and a revolutionary undiscipline. The first is represented by all those formally undisciplined practices that on the contrary are strongly and structurally within the disciplined capitalist logic, corroborating that not being conventional does not mean being undisciplined. The second concerns exploring and forcing the structural limits of disciplinary cages made of disciplined methods. Concretely linked to multidisciplinary, since it seeks to explore other methods, it means recognizing other ways of doing research that are not within disciplined logic. The third concerns formal experimentation useful for breaking the disciplinary cage, overcoming the distinction between object and subject of research, claiming a knowledge that passes through the body and emotions. Finally, the fourth is the revolutionary one, which disobeys the canon not so much to innovate the discipline - and generally create a new canon - but because that canon reproduces structures of power and oppression that we want to break down.

Building upon feminist practice and theory, Armiero et al. (2019) state that undisciplinarity is not primarily or necessarily a rational choice, it comes from your personal story, from conditions not of your own making. At the same time, undisciplining ourselves is an existential choice that, in academia, could be part of a wider societal purpose of radicalizing and transforming our way of thinking politically about the socio-ecological conditions of human and non-human existence.

Therefore, PE deserves the credit of having called attention to the need to bring back justice and the political into the environment, and vice-versa and of having critically questioned which should be the role of scholars in working together with fence-line communities. They also have mobilized strong statements against the current disciplined, competitive, and productivist modality of making research, whereas they have explored much less what it means practically to be undisciplined and to construct collective knowledge aimed to trigger emancipatory process and more justice. If PE has contributed a lot in retracing and mapping the several socio-economic environmental conflicts in the world, only a small amount of its theoretical works have concerned the narrative and counter-narrative that downplay or amplify the subaltern voices, especially in those contexts of slow everyday disasters and violence.

Between Environmental Justice and Conflicts in Italy: an overview

The environmental movements are present in Italy since the 60s. The Italian green archipelago has been quite varied (Diani 1988) and crucial in generating public debate on some topical issues, such as nuclear energy and environmental conservation and protection, but much more recent has been the appearance of the environmental justice concept both in the use of activists and scholars (*virus del benessere*).

According to Francesca Rosignoli (2017), if it is true that the term “Environmental Justice” first appeared in Italy in early 2000, it must be recognized how since the 1960s numerous environmental conflicts have occurred and, even if not labeled as environmental justice struggles, they may likely be framed through the lens of the environmental justice paradigm. Rosignoli’s work has consisted on the one side to be tracing back precisely those conflicts that have been turning points in the history of the environmental movement in Italy by unfolding them according to the environmental justice lens; on the other side in re-framing the environmental justice studies in relation to the peculiarities of the Italian theories and history.

About the review of the emblematic environmental conflicts that occurred over time, Rosignoli quotes from the Partinico case, the Vajont dam landslide, the Seveso and Manfredonia disasters, and the Land of Fire. Partinico is a village in Sicily where the management of natural resources, above all, water, was in the hands of a mafia-corrupted system that kept in check the local peasants. Danilo Dolci, known as the “Gandhi of Sicily” or more simply the “Italian Gandhi”, co-founded a center of research and action and promoted several nonviolent mobilizations to fight against organized crime. The main goal of the protest was to provide equal access to water, by challenging the Mafia’s monopoly of water supply (Dolci 2010), and denouncing the lack of electricity, running water or sewers, and the dire conditions of local communities. At the core of his strategies, there is the idea of grassroots participation as a way to achieve a more participative democracy in the interest of (environmental) common goods. Although at that time its innovative and eruptive work was not framed from the environmental justice lens, it can actually be considered as the first experience of the struggle for environmental justice in Italy (Rosignoli 2017, 2020).

The Vajont dam disaster pertains to the landslide of about 300 million cubic meters of rock from Mount Toc that killed around 2000 people living in the surrounding areas. Thanks to the effort of a few investigative journalists and more recently of Marco Armiero, this story can be told by shedding light on both the unequal distribution of environmental burdens and benefits and the power dynamics underpinning the occupation and complicity of the State and the enslavement of science in dealing with interest and profit of big corporations.

The Seveso and Manfredonia disasters took on the role of dramatically inserting the topic of industrial risk into the public debate. Seveso’s case focuses on a catastrophic event that occurred at the ICMESA’s chemical plant in Meda (Lombardy, Italy) in 1976. Due to overheating, an interruption in the production cycle, and outdated equipment, a cloud of chemicals containing 2,3,7,8-Tetrachlorodibenzo-p-dioxin (‘TCDD’ or ‘dioxin’) was accidentally released into the atmosphere. The toxic cloud fell onto an area of 1810 hectares,

including the municipality of Seveso and other surrounding communities. Since then, both awareness by citizens, and public institutions and debates in academic and scientific circles on risk have led to many changes, such as the introduction of national, European, and international regulations which aimed to prevent or mitigate possible hazards.

The Seveso case somehow can be considered the “Italian” Love Canal especially for its particular relevance on public opinion, as this excerpt describes.

Seveso’s accident had a much stronger effect on public opinion. Local authorities did not know what to do; various miraculous and ineffective remedies were proposed to decontaminate the areas exposed to dioxin; people, especially pregnant women, were terrified about the future of their children; for the first time there was talk of the need to authorize abortions (Nebbia 2014: 185).

Indeed, just a few months after the Seveso disaster, a second toxic cloud released into the atmosphere several tons of potassium carbonate and a bicarbonate solution containing arsenic trioxide coming from the Enichem petrochemical plant (ENI) in Manfredonia, a town located in Apulia, a region in Southern Italy. This case was labeled as the ‘Seveso del Sud’ (the Seveso of the South).

Another environmental conflict that can be considered as an important benchmark within the Italian history of EJ (Rosignoli 2017: 937) is the “Land of Fires” case. This case concerns the area adjacent to the northeast of Naples and the southwest of Caserta, which was strongly affected by the illegal disposal of toxic waste. Since the 1980s, the Camorra (Neapolitan mafia) has been burning and/or burying special waste, often mixed with urban waste (Armiero and D’Alisa 2013: 9). The Neapolitan case has been at the center of numerous researchers who have denounced how the call for an emergency regime has intended to disempower all the grassroots movements and local communities struggling to stop the continuous mismanagement and illegality permeating the waste dump affairs. Also, this case can be attributed to Marco Armiero, together with other scholars, the merit of having conceived and framed the Neapolitan case with respect to the environmental justice studies (Armiero and D’Alisa 2012; Armiero and Fava 2016; Iengo and Armiero 2017).

A correlated but different discourse concerns a story that is a “very Italian one” regarding the numerous petrochemical industrial poles that have been built between the 50s and the 60s with the goal, as I have already mentioned in the introduction, of becoming the fly-wheel of development above all for all those depressed areas. Stemming especially from State top-down policies and investments in accordance with some parastatal companies and corporations, the spread of what has been defined as “cathedrals in the deserts” has left more burdens than positive effects. In Chapter 3.4., through the specific case of Gela, I will demonstrate that these industrial poles, despite apparently and in the short term have increased employment rate and the general wellbeing and “happiness object” (Ahmed 2010), in fact, in the long term, their positive waterfall effects have concerned only a few specific sectors of the society, while health and environmental issues have destroyed entire socio-ecosystems. However, most of the time, the local communities have not organized forms of patent,

lasting, crosscutting protests, rather, the collective frustrations have been mostly expressed in a more fragmented way. According to Benadusi et al. (2021) and Saitta (2009), the narrative of the companies bringing modernity and civility even before that job still permeates the local communities. As a consequence, there is a bivalent or rather “schizophrenic behavior” (Messina 2005; Gravagno and Messina 2008) from the citizens who are contemporarily complaining about the effects of the pole without being really able to oppose them. These forms of silent and/or contradictory conflicts, in the face of a contamination legacy made of concrete punctual and diffused damage and health issues, are a field that may deserve to be further explored, both embracing the environmental conflicts and environmental justice lens.

In light of these just-mentioned cases, it is evident how the Italian discourse on environmental justice has been introduced by a bottom-up process in which the keywords have been environmental conflicts, rather than environmental injustice, racial injustice, and socio-economic inequalities. According to Francesca Rosignoli (2017) another specific characteristic regards the positive interpretations of conflicts that are nestled in the Italian cultural tradition according to which participation is conceived as the inevitable clash of interest within and among diverse competing political forces, and it embraces a view of the republic as a theatre of turbulence (Diez 1998: 20). The protesters are depicted as guardians of liberty promoting the common good of society as a whole (Rosignoli 2017: 941). The centrality of conflicts certainly plays an important role in identifying the major strength of environmental justice discourse in Italy, as Marco Armiero (2008: 60) has also highlighted: “a garbage dump in a neighborhood, cancer in a body, the transformation of a forest into a wood quarry: these signs in the ecological landscape exhibit changes in technological/cultural systems; I argue that those signs also need to be interpreted as a manifestation of socio-ecological relations informed by power. I will illustrate that a conflict-based approach enables us to see these relations”.

According to Luigi Bobbio (2011) there are six interpretations of conflicts that can be summarized by the following keywords: particularism, spreading dissension, disproportionate costs involved in relation to the benefits gained, places against flows, and the development model.

As observed for environmental movements, which scarcely use the term and do not define themselves as part of that movement (Armiero 2014b), environmental justice in Italy is likewise not a much-debated topic by academics. Both academics and activists, indeed, largely frame environmental issues by the term environmental conflicts. Quite emblematic in this sense is the realization of the *Atlante Italiano dei Conflitti Ambientali* (Italian Atlas of Environmental Conflicts) as a part of the project *Centro di Documentazione Conflitti Ambientali* (Environmental Conflicts Documentation Center) led by ASud⁶⁴. On their website, they explain why environmental conflicts “An environmental conflict is a particular type of social conflict that has arisen around environmental causes. These causes can be of different nature: production or extraction policies,

⁶⁴ With the support of the Ejolt Project, funded by the FP7 program of the European Commission and with the contribution of the ISCC - Transformations to Sustainability grant.

infrastructure projects, waste disposal or treatment projects, national or supranational commercial or financial policies. In general, an environmental conflict is characterized by the concomitance of two factors:

- on the one hand, the qualitative or quantitative reduction of available environmental resources (air, water, biodiversity, arable land, biodiversity, raw materials, and other common goods of a finite nature);
- on the other, the presence of an opposition/resistance on the part of civic society (communities involved or damaged, organization and social movements, etc.) which mobilize to defend the environment, common goods, their rights, different management models of resources".

The centrality of the conflict within the environmental justice discourse in Italy makes EJ different with respect to the ones in other contexts, especially in the US. More in detail, as I mentioned in the previous chapter, the dilemma "race Vs class" has been at the center of several discussions within, above all, the U.S. academia. While the vast majority of studies of environmental inequality conclude that racism is the major driving factor in producing injustice in the US, together with corners of reflections about the degree to which this phenomenon is a function of class-based market dynamics, however the Italian context is quite different. In regards to the racial issues, despite the increasing number of migrants having a different race, ethnicity and culture, Italy has been at length relatively "homogenous", at least from that point of view. Some studies and data have revealed how, for instance, migrants are often those who live in peripheral or distressed areas and more frequently have less quality of life⁶⁵; this slightly remembers the dilemma "chickens or eggs", but not in a really equivalent way with the American context. In exploring which kind of environmental inequalities emerge from empirical analysis, Germani et al. (2014) has examined the relationship between income, demographic characteristics, and concentrations of air industrial pollutants within the Italian provinces. Her findings reveal that air releases tend to be higher in provinces with a high concentration of females as households' heads and with a high concentration of children. This suggests that, rather than along racial or ethnic terms, environmental justice issues in Italy are more likely to manifest in terms of social categories and gender composition.

For sure the class categories are more appropriate to describe which have been the discretionary borders according to which the geographies of socio-environmental injustice have taken shape in the Italian territories, especially historically. In this regard, Armiero points out that both the city/rural areas dialectic and the consolidated experience of the communist party and, more in general, of the Italian left-wing history, have assumed a peculiar sense in the way the environmental justice issues are approached in the Italian context (Armiero 2013).

In order to comprehend the degree to which this phenomenon is a function of class-based market dynamics, it is worth noting that the process of Italian industrialization is confronted with an ideological element that makes

⁶⁵ http://www.cestim.it/sezioni/dati_statistici/italia/Idos/2020-ITALIA_SCHEDA%20SINTESI.pdf

industrial relations take on a political connotation. The communist and socialist parties use the workers' movement as an outpost of a political goal: the political revolution. However, it should be noted that Italy industrialized itself very late compared to other countries. If World War has guaranteed industrialization for Italy, the share of those employed in the industry is greater than that of those employed in agriculture, thanks to war orders. But it is an unbalanced growth because it concerns only the north-west and only the mechanical, steel, and chemical sectors. From 1920 onwards, the crisis between banks and businesses marked the entry of the State as an entrepreneur. The State in Italy became a subject that entered the economy because it:

- Created a public facility that saved the banks
- Created a public structure that acquired control of some companies

The State also continued to influence and play a crucial role in the economic system after the Second World War when it decided to carry out the strategies of development poles according to which to allocate huge petrochemical industrial plants close to resources and in distressed areas. Such top-down public policies of development see huge parastatal corporations taking the field, among those, ENI - "Ente Nazionale Idrocarburi" (National Hydrocarbons Board). The peculiarities of the socio-economic fabrics are the interplay between the process of intense industrialization of very environmentally impacting infrastructures, structures, and factories with the historic Mezzogiorno (Southern) issue. If the northern part industrialized after the unification of Italy, the agricultural system was still the main source of daily life in the South. The already mentioned case "Land of Fires" took place in Campania, a southern region in which for many years the waste coming from northern (if not foreign) companies were dumped. It is not by chance that the Legambiente annual report displays that in the southern Italian regions (Campania, Puglia, Sicily and Calabria) there are a significantly higher number of environmental crimes (Legambiente 2020).

What I mean is that for sure racial justice movements in the US are not really comparable with the Italian ones, but some similarities can be found by looking at the class issues and the socio-economic and working-class issues that depict (at least) "two different Italies" having different socio-economic structure and democratic awareness. In addition to the class issues, the geographical collocation -being from the South or from the North of Italy- has seemed to play a quite relevant influence.

Despite the relatively recent appearance of environmental justice within the Italian academia and among activists, it can be recognized as an increasing ferment both in the types of ongoing struggles, in the language and reflections by activists and the academia.

An example of a bottom-up organization that is using environmental justice concepts is ASud. Started in 2003, ASud is a non-profit that tackles environmental issues thickly intertwined with socio-economic issues. Its work has been cutting-edge in relation to the Italian context by merging research with training, cooperation and activism. ASud has been able to be in-network with other environmental grassroots movements both at the local and international level by also informing their activities of knowledge, scientific and academic

background. Moreover, ASud is exploring how the construction of knowledge can be an emancipatory tool for achieving more environmental justice, in particular, through a recent project of citizen science that, anyway, was not able to jump from the mere collection of scientific data to a more politicized construction of knowledge.

A much more critical standpoint comes from “Ecologie Politiche del Territorio” (Political Ecologies of the Territory), which is a laboratory of studies and advanced training about political ecology. The members define it as a place of intersection and convergence between different disciplines and cultural institutions, which has at the center of its activities the need to reflect and train on the main positions expressed by the ecological thought of the twentieth century but also on the new forms that are taking on the ecological debate today. Ecologie Politiche del Territorio represents an interdisciplinary field of study where studios and activists from different backgrounds can meet and collaborate around the theme of environmental emergency. The distinctive feature of this group is that it blurred the boundaries between research and activism since it is made of activist scholars as well as of very critical and informed activists. By merging activism and academic expressive languages, this group promotes both scientific, sectorial, and more popular and didactic articles and books (I was one of the co-authors of one of them: Privitera 2021a), but also workshops and public events. They have the merit of feeding and complexifying the Italian debate about environment protection by connecting it with critical researches from everywhere in the world. In particular, in my opinion, they have given a relevant contribution for having brought into the Italian debate the Anthropocene discourse by confronting it with Jason Moore’s concept of Capitalocene and amplifying it to the themes of degrowth, interspecies justice, and ecofeminism.

Another ongoing experience is the project REVERSE: "REVERSE" (Responsible research, VERSatile Knowledge, Environmental futures in action) of which I am part as well. "REVERSE" arose from an interdepartmental grant from the University of Catania. Despite being an academic project, since the beginning, the goals of its members -anthropologists, geographers, planners, sociologists- have been to challenge the "academic ivory tower" by experiments in the field with the criticalities and opportunities of working together with local communities struggling with socio-ecological issues in the Sicilian territory. It started in 2020 and so far, in addition, to give birth to an edited volume (Benadusi et al. 2021), this project is supporting some workshops with activists and schools.

A more divulgant and academic spin characterizes "Environmental justice Italy" (EJ Italy), a network of young Italian scholars dealing with environmental justice and having different backgrounds. Created after an international conference on Transformative Connections on Environmental Justice (Norwich, 2019), this network aims to set up a research group made up of only women to carry on the debate on environmental justice in Italy.

Finally, more recently, scientists working for the national epidemiological surveillance system of communities residing close to industrially contaminated sites (named SENTIERI) developed a multidisciplinary reflection

on how local epidemiological surveillance systems can be implemented to document local conditions of distributive injustice (Pasetto et al. 2020). This team has also realized a categorization of the dimensions of community capacity in the context of the industrially contaminated sites that could provide a mapping useful for promoting environmental justice within the Italian scientific production of knowledge.

Theorizing Environmental Justice Studies and Practices

Several scholars have tried to theorize the studies about environmental justice. Already at the end of the 90s scholars have envisioned how to advance a theory of environmental justice (Pellow 2000). Some American scholars have reviewed environmental justice studies and dug into the reason why injustices exist. For instance, Mohai et al. 2009 have recognized three possible explanations: economic explanations, sociopolitical explanations, and racial discrimination explanations. Economic explanations are sometimes defined as market dynamics explanations. According to this explanation, the industry is not intentionally discriminating against either racial and ethnic minorities or the poor. The industry is simply trying to maximize profits and hence reduce the cost of doing business. Thus, when siting a new facility, the industry seeks to place facilities where land is cheap and where industrial labor pools and sources of materials are nearby.

Sociopolitical explanations involve the argument that industry and government seek the path of least resistance when citing new hazardous waste or polluting industrial facilities. Because industry and government do not want to generate controversy or experience delays in moving ahead with siting plans, they seek to avoid communities that are most capable of mounting an effective opposition. Racial discrimination explanations expand beyond and emphasize how race can also play a role in the way environmental burdens are distributed through housing segregation.

David N. Pellow (2003), for instance, has suggested an environmental inequality formation (EIF) perspective in order to complexify how environmental racism and inequalities originate and emerge. In his proposal, there are three major points that are largely neglected in research on environmental inequalities, which are the importance of process and history, the role of multiple stakeholder relationships, and a life-cycle approach to the study of hazards. Stemming from this, I find many similarities with the CEJ he proposed almost twenty years later (Pellow 2016, 2018)⁶⁶.

⁶⁶ While I was analyzing my literature review, I found several links between the EIF and the CEJ. For instance, in EIF, Pellow maintains that a temporal dimension of the process is needed, in CEJ he calls for more multiple-scale temporal analysis in the second pillar. In EIF, David declares that more attention should be given to multi-stakeholder reality, in CEJ's first pillar he upgrades and enlarges the "perpetrator-victim scenario" by including non-human communities that were almost absent before. Finally, in EIF, David talks about the life-cycle approach that reminds me and seems, in my perspective, a kind of precursor of the multiscale spatial analysis envisioned by him in the second pillar of CEJ.

An important contribution comes from the work by David Schlosberg (2007) who has enlarged the theories about environmental justice from mainly a distributional one to a justice theory that has developed a number of additional ways of understanding the processes of justice and injustice. He recognized how thought and reflective advancement coming from the justice theories were not finding application (both practical and speculative) neither in the environmental justice movements nor in the environmental justice studies. With his work, he has called for and tried to merge the theory of justice with environmental justice theories (Schlosberg 2007) in order to develop a number of additional ways of understanding the processes of justice and injustice.

In particular, he widely discusses how justice has been conceived as distribution, recognition, procedural, and capabilities.

Justice as distribution regards all those focusing on how to achieve equitable distribution of environmental benefits and burdens and it aims to equally distribute the social primary goods. The maldistribution has been at the root of the environmental justice movements as well as a main focus of environmental justice studies. Scholars, such as Young, argue that distributive justice does not go far enough because it does not include recognition of differences in the social realm—differences that go beyond who has how much. Similarly, Fraser insists that ‘[j]ustice today requires both redistribution and recognition’ (1997: 12). ‘Justice requires both, as neither is sufficient’.

Recognition is the central concern, as both Young and Fraser—contend that a lack of recognition in the social and political realms, demonstrated by various forms of insults, degradation, and devaluation at both the individual and cultural level, inflicts damage to oppressed individuals and communities in the political and cultural realms. While more traditional justice theorists focus on ideal schemes and processes of justice in liberal societies, recognition theorists have made clear that attention to the real impediments to such schemes must be addressed with attention to the existence or denial of recognition in both the political and socio-cultural realms. This is an injustice not only because it constrains people and does them harm, but also because it is the foundation for distributive injustice. Young's argument is that “a concept of justice needs to focus more generally on the elimination of institutionalized domination and oppression” (Young 1990: 26). In order to accomplish this, justice must focus on the political process as a way to address a variety of injustices, including both the inequitable distribution of social goods and the conditions undermining social recognition. This leads directly to Young's insistence on participatory democratic structures to address existing injustices based on both distribution and recognition. This is linked with another justice theory that is the so-called procedural justice according to which, through the more participatory and deliberative democracy approach, more justice can be achieved. This theory in short could be summarized as follows: “the important thing is to choose the rules of the game”. Improved participatory mechanisms can help ameliorate both other forms of injustice, but those forms of injustice must be addressed in order to improve participation. If you are not recognized, you do not participate; if you do not participate, you are not recognized. In this respect, justice must focus on the political process as a way to address both the inequitable distribution of social goods and the conditions

undermining social recognition. “Democratic and participatory decision-making procedures are then both an element of, and a condition for, social justice” (Young 1990: 23); they simultaneously challenge institutionalized exclusion, social culture of misrecognition, and current distributional patterns. Finally, another well known theory of justice that only recently has been applied to environmental justice studies is the capabilities approach. Originally envisioned by Amartya Sen and Martha Nussbaum, this school of thought judges only arrangements not only in simple distributive terms but also more particularly in how those distributions affect our well-being and how we ‘function’. Capabilities are about a person’s opportunities to do and to be what they choose in the context of a given society. In short, the capabilities approach argues that the goal is to ensure "right" points of arrival - a more substantial and goal-oriented perspective. Nussbaum defines it as outcome-oriented and has coined the concept of “threshold” of capacity below which one must not go down (threshold). The capabilities approach is linked with the substantive justice aspects based on the right to live and enjoy a clean and healthy environment. By stemming from the capability approach, Sen notes how capabilities resulting from collective action remain “socially dependent individual capabilities” (Sen 2002: 85); others call for collective capabilities integrated with human capabilities (Robeyns 2017) categorizing them as resistant and resilient (Rosignoli 2018).

The attempts to merge empirical works with theoretical theories on environmental justice studies can also be found in international relations that have begun to tackle the question of global environmental inequality/racism.

Shortly after the movement for environmental justice in the United States made headlines in the early 1980s, activists, and policymakers began to take notice of similar patterns of environmental inequality around the globe. Scholars of environmental justice studies and international relations have begun to tackle the question of global environmental inequality/racism. Two levels of inequality are being increasingly cited: transnational and global. Extraction-based corporations are expanding operations to the remotest corners of the world, but the people affected there are sometimes able to utilize electronic communications to gain wider attention to their plight. Meanwhile, some hazards such as climate change are truly global, worsening existing inequalities in terms of who caused and suffers from the problem, and who has the resources to cope with its mounting impacts.

This need for thinking globally and on a wider scale has led to the call for an environmental justice research framework able to dwell on all the different visions, empirical, and theoretical works. Among numerous definitions, international justice is a political concept that refers in essence to relations of peoples and countries. Global justice comes closest to what has been defined as “planetary justice” (Biermann and Kalfagianni 2020). The planetary justice framework entails a planetary scale, planetary society-nature integration, and non-binary system thinking stand. According to Biermann, Frank, and Kalfagianni, Agni (2020: 1) what is needed now is a richer debate on the conceptual foundations of what justice research on global sustainability and environmental change could mean. This is especially the case in order to turn from a normative debate on

planetary justice ('what is just?') towards an empirical debate on what conceptualizations of justice different actors in global environmental politics actually support. Biermann et al. (2020) recognize five main approaches toward justice. These five traditions are liberal egalitarianism, cosmopolitanism, the capabilities approach, libertarianism, and critical perspectives.

Liberal egalitarianism is a philosophical position that seeks to combine the values of equality, personal freedom, and personal responsibility. Justice is determined here by how institutions assign fundamental rights and duties as well as economic opportunities in society in order to correct for the arbitrariness of one's life expectations due to factors beyond their control. These cosmopolitan theories, all of which argue for some degree of (global) community among all human beings regardless of their social and political affiliation.

Such cosmopolitan approaches to justice, then, aim to specify what constitutes a globally fair distribution of benefits and burdens in the context of a globalized world.

The capabilities approach is a normative framework that evaluates institutions according to their impact on effective opportunities, that is, the capabilities that people have to lead a valuable and dignified life. In contrast to Rawlsian liberal egalitarianism, the focus here is not on means (e.g., income) but on ends (e.g., human dignity). The reason is that people differ in their ability to convert means into valuable opportunities to live the kind of life that they have reason to live.

A fourth position is libertarianism, a normative perspective that affirms the rights of individuals to liberty, ownership, and free exchange. Libertarianism views existing wealth distribution as legitimate as long as such wealth has been gained by lawful activities.

A fifth intellectual tradition is the critical perspectives, questioning the structural conditions that create injustice. This tradition has some roots in Marxism, but encompasses also a diverse set of other approaches that seek human emancipation from structural injustices, in particular, feminism. Critical perspectives pay specific attention to the role of the political agency of those suffering injustices in how to address them.

Despite the literature production, this topic is countless and varies. I have presented it in short because my attempt is not to give an exhaustive and in-depth overview, rather show how the environmental risk has been tackled, both theoretically and practically, in a varied, heterogeneous and inspiring way that is able to interrogate the social and power-driven-dynamics of environmental injustice.

Final Remarks

To sum up, in this chapter, I have tried to trespass varied fields of knowledge -namely the environmental justice studies, the environmental humanities, and political ecology- in order to deeper comprehend how they have adopted the debate related to the risk topics. Within all disciplines I have crossed, the risk is approached

through a series of theoretical and methodological tools that are able to uncover the injustice taking into consideration the multiple actors that are involved, both human and more than human.

The journey through the ways in which disciplines such as environmental justice studies, the environmental humanities, and the political ecology deal with the construction of risk knowledge, especially the one related to the environmental risk due to industrialization, has allowed us to learn of the manifold theoretical, methodological, and practical tools so-far envisioned and experimented and to enlarge our wealth of knowledge.

First, I delved into the debate about the origins and main development and declinations of the Anthropocene, by linking this concept to the risk theories. The Anthropocene has been the subject of several re-significations and re-definitions that, in my perspective, help us to analyze how the risk -result of human modernization- has been and may be narrated and faced in different ways. The concept of the Wasteocene well represents the reading and interpretation of socio-ecological transformations over time through wasted relationships that are power- and unjust relationships. The Capitalocene has made a link that “changes everything” (Klein 2014) and that provides a reading of the economic reasons behind the creation of risk society. While the declination of the Capitalocene and Wasteocene gives emphasis on the socio-ecosystem cause of the current environmental crisis period, the Chthulucene seeks to underline interspecies (in)justice and suggest to “make kin” i.e., recognizing the nature as made of ecological allies.

Then, I explained how EJ movements, EJ studies and PE are used to tackle the risk. I presented how Martínez Alier and PE, as well as neo-Marxism have approached the risk through the concept of metabolism so as to intercept the flows of both material and money that produce and reproduce expulsion and marginalization.

Then, I have gone through the heterogeneous modalities in which civic society has organized itself in environmental movements and groups in order to denounce and press institutions for working for a future, having a more harmonic relationship with nature. In particular, I tried to unfold the several shades of environmentalism over time and space, by underscoring the low commitment of these green movements with social issues, power relationships, and justice. Then, I focused on the environmental justice movement that has the merit to have interplayed the socio-economic disparities with both health and environmental inequalities. Environmental justice studies and political ecology have analyzed how bottom-up movements are able to self-organize and challenge the structures of power. They have also investigated the experimental cognitive tools that have been applied by activists, such as popular epidemiology and toxic tours. By doing so, both environmental justice studies and political ecology have scrutinized, complexified, and often supported what Ulrich Beck defined as the sub-political actors. More recent studies of environmental justice together with environmental humanities have pushed further their reflections toward the agency of human and non-human communities in being part of unjust socio-natures i.e., the entanglement between buildings, roads, communication technologies, and residential. These fresh works, often influenced by material feminist epistemologies, the body, the personal experience, the perceptions, and the sense are cognitive tools through

which to read the embedded (capitalistic) injustice but also to react and construct a situated counter-knowledge and science. The toxic bodies are lenses through which to read the trans-corporeality of nature. In some cases, the political embodiment has converted the body into an arena of conflicts and has spawned a sense of "biological citizenship". It is a change of viewpoint that first emphasizes the partial vision and bodily perspective and that lays at the basis of situated knowledge. In addition to the bodily and political embodiment, another consequence of taking into consideration the human and above all the more than human communities is to quest for the role of humans both as co-creator (Shiva 2016) or custodian (Bergoglio 2008).

Regardless, humans are co-creators or custodians of the earth, they are not a homogenous group, and instead, they display multiple typologies of inequalities and differences based on gender, ethnicity, and race.

To trespass these fields of knowledge has allowed me:

- To acknowledge the different forms of injustice, not only distribution but also recognition, procedural, substantive (Scholsberg 2007);
- To articulate the tensions, conflicts, or negotiations between State and grassroots movements, by giving emphasis both on the drawbacks and potentialities of such interactions;
- To learn how these "disciplines" have gone through, and in some cases supported, new ways to construct knowledge, of which are examples the experiences of citizen science, popular epidemiology, but also walking interviews, toxic tours; and
- To reflect on what to learn from "being indisciplined" from an epistemological view

All these fields of knowledge have been put on the table, proposed, and experimented on with new forms of knowledge that are able to debunk traditional ways to approach the risk topic and provide insightful ideas and fresh perspectives on how to comprehend the risk and to produce knowledge about the risk.

Despite all this considerable wealth of reflection and knowledge, I can discern some gaps in how such knowledge not only should be constructed but also, above all, can be a trigger of that empowerment of the community. For sure some scholars have called for action and engagement (see for instance Armiero 2008; Pellow 2003; Davies 2018), however how this can be turned into cultural empowerment of civic society is still lacking. This involves both questioning in depth the way to coproduce knowledge i.e., the epistemologies at the basis of it, and the capacity to convert the coproduction of knowledge into "active imagination" (Pellow 2009: 6).

Another lack, in my perspective, regards the absence of a deep ecological spatial perspective. Despite the political ecology it has for instance dedicated much research in mapping and geo-referencing of the

environmental conflicts and environmental justice studies have widely shed light on the interplay between the distribution of burden and the socio-economic status of civic society; the spatial planning visions are lacking.

In the space, it can read injustices, while, through the space, injustice can be perpetrated and amplified, again through the transformation of the space it is possible to smooth such injustices, a goal that can be achieved through planning.

With the drawback of often limiting themselves to a critical and not practically engaged role, these same disciplines have the merit of supporting the potentialities of toxic autobiographies and resistant practices as ways to envision possible anti-extractivist alternatives based on commons, solidarity self-organization, and regrowth. After all, the risk society needs “Freedom Dreams”—those visions of a better world in which the shackles of the present are sloughed off in favor of a just society (Kelley 2002).

In a nutshell, these fields of knowledge, just crossed in this chapter, embrace a multi-scale perspective, above all from a temporal point of view that entails a *longue duree* historic perspective and a qualitative reading of the slow violent transformations. This means scrutinizing not only the patent and visible injustice but also the more invisible ones.

While these previously mentioned fields of knowledge have widely deepened, the varied forms of environmentalism and community’s reaction to the earth risk, how have these advancements influenced the planning? Especially the planning of those areas that appear particularly at risk, a slow violent everyday risk? I aspire to discuss this question in the next chapter.

1.4 Navigate the gaps in order to envision alternative possibilities: toward a problem statement

This chapter explains which gap my thesis hopes to fill. An approach focusing almost exclusively on a quantitative and technocratic analysis of risk can uncover neither the socio-economic and environmental transformations of risk landscapes nor the community's responses to risk. I aim to show how this inadequacy is even more apparent in "slow disasters" such as the ones due to industrial contamination, in which harm is the product of long and gradual processes of environmental degradation and entwined failures of nested sociocultural, political, and technological issues involving both human and more-than-human communities.

Get lost in knowledge-land, and then find yourself again

I started by saying: "the dissertation is an open and unexplored field in which to get lost, to venture, to find oneself, while, quoting the Griffin in "Alice in Wonderland", I declared "Let's start with the adventure, the explanations are always too long!".

And, after we got lost, ventured into the academic knowledge-land, we necessarily arrived at the moment of "finding ourselves", at the moment of the explanations. In particular, this work started with the goal of understanding how it is possible to envision and put into practice a fairer planning in all those risk landscapes that, due to the contamination, have been widely affected from a social, environmental, economic, and cultural point of view. In order to do it, after an explanation on how the several theories of risk have faced the construction of risk knowledge until the concept of risk landscapes, I have crossed several fields of knowledge, and more precisely, the environmental justice studies, environmental humanities, political ecology, and regional planning. The objective of the entire first chapter, divided into sub-chapters 1.1, 1.2, 1.3, and 1.4, has been, hence, to dip up both the gaps and potentialities from which to start to propose an improvement in the way planning deals with the construction of knowledge in powerless and contaminated risk landscapes.

To sum up, in Chapter 1.1, my attempt has been to scrutinize the features, potentialities, and gaps of risk theories (treadmill of production, the ecological modernization, and the risk society) by giving particular attention to how these theories deal with the construction of risk knowledge. The treadmill of production has given a fundamental contribution to linking the socio-environmental despoliation and losses with our current (nowadays globalized) capitalistic system, and has given less space, with few exceptions, to critically engage and question how this treadmill of production may entail and be connected with a sort of "treadmill of scientific production of risk knowledge". Diversely, both the ecological modernization and risk society theories, notwithstanding, do not investigate in-depth the socio-economic reason underpinning our reflective modernity, they involve and unravel in-depth the role of technology and of experts in dealing with risk. More specifically, ecological modernization points to the expert knowledge and technology to face the imminent risk (from

industrial pollution to climate change) by relying on what is defined as the "technological fix". On the contrary, the risk society highlights that technology is the cause of current risk and could not be the only solution. Rather, an appeal to a democratic improvement through the involvement of sub-politics may be a solution. In this sense, these three theories have helped me to better frame the risk topic both with respect to our global capitalistic economic system and, even more, with respect to the building of risk knowledge: a theme that navigates a tricky limen between lay and expert knowledge that is still controversial but full of potential flourishing. After I have critically presented how these main theories about risk have engaged the production of knowledge, I tackled the epistemological and methodical debate that constitutes the theoretical frame guiding the relationship between expert and lay knowledge. If Callon (1999) has provided some models of this interaction and has pointed out how the co-production one requires further development, other scholars have incited for an epistemological turn toward what has been defined as a "post-normal science" that, by including an "extended peer community", it is able to better deal with the uncertainties characterizing the current risk society. If theoretically the public understanding of science and its co-production has been widely formulated, this literature has not offered very practical suggestions on how to actually convert this theory into practical tools of co-production of knowledge that can be rooted in the real local contexts -above all the most powerless ones- while, simultaneously, democratize technology, democratize democracy and trigger collective learning and emancipation.

The search for a multifold and situated process to construct knowledge has led me to the need for a spatial turn toward a more overarching concept of riskscapes that is able to catch alternative and deeper spatial data and meanings. I analyzed the existing literature on the concept of riskscapes and what I found was that despite this literature has embraced risk landscape as a complex multi-layer concept from which to read and analyze social, cultural, racial, and environmental inequalities both from a distributional but also more theoretical and methodological point of view, it has not included all those phenomena occurring slowly in time and space. Similarly, the concept of pollution landscapes also lacks this temporal scale. In order to include a more varied and comprehensive knowledge of risk, I argue that it is needed to equip a broader interpretation of risk landscapes that is able to catch slow violent burning issues.

In Chapter 1.2 I attempted to critically review how the planning discipline has dealt with the environmental risk issues over time until now. From the planning field some critical and insightful consideration can be deduced and can help to understand how to improve the planning of risk landscapes. I have explained how planning is historically a child of the rationalism approach that, by applying positivist scientific methods to the planning issues, has sought objective and top-down choice. This legacy can be found in the way mainstream planning has tackled (and it is still tackling) the uncertainties of our risk society by borrowing from other risk fields, such as earthquake risk management, the separation of risk in vulnerability, danger, and exposition. By reckoning more and more on progress and technological advancement, some sections of urban planning, from the modernist ones, have become increasingly techno-driven and have started to use the label of "smart city" to blur any critique. They represent a sort of follow-up of the ecological modernization theory. Albeit the

techno-driven approach has been resolute in facing many burning issues over time, however, it is unable to catch the social injustice issues, the complex relationship (more than) human-society-environment and how these relationships have changed. Furthermore, it is not appropriate for all slow burning issues occurring in diffused ways into time and space, plus it is not able to deeply intercept and unpack the injustice and power relationships that subtended the environmental risk.

It is fair to point out that the smart-driven solutions were not the only ones enforced by the planning, indeed, other scholars have maintained how more resilience may be an answer to the current uncertainties. Other families of studies indicate that the nature-based solution may be a way to mitigate environmental risk in the city, but they refer to it much less as a way to achieve more social justice in the city. The latter is a strand of inquiry that has been recognized as needing further theoretical and empirical works (Cousins 2021). Interestingly, within planning, the topic of environmental risk has been poorly intertwined with the one of social justice. While the theorization of justice is the core of a vivid debate among planners, how to convert these abstract developments into practical changes in our city aimed at obtaining in the meanwhile more social and environmental justice is still quite an unexplored field. In fact, the topic of justice has been mainly treated in procedural and deliberative terms i.e., in connection with the participatory strand of planning sustaining that larger participation already implies more justice and being mirrored in the elaboration of different innovative types of planning (e.g., communicative, transactive, collaborative, etc.) having each its own peculiarities. Another effort can be seen in "the just city" concepts that, however, most embrace a neo-institutional vision, how to reach which is not clear in practical terms, especially in all those places characterized by weak institutions, whose Gela is quite an emblematic example. Differently, another strand dealing with justice in terms of social equity and recognition comes from the radical planning and insurgent planning practices that, however, have relatively given small space to environmental justice issues, to environmental risk and risk knowledge i.e., on how to move from the insurgent planning knowledge to planning transformative practices. Agyeman (2005, 2013) has been the one who stubbornly has tried to merge the environmental justice discourse into the planning for sustainability by envisioning the bridging and overarching concept of just sustainabilities.

Although Agyeman has used his theoretical concepts to interpret and analyse concrete urban experience, a real call for a spatial turn in seeking justice can be found in Soja's work.

However, to reach an approach to risk as a landscape territorial phenomenon, another strand of literature may provide some enlightening insights i.e., the relational planning and territorialist approach dealing with territory and landscapes as a relational field in which all components play a creative role in a collective dance. Stemming from this cultural cradle, a very inspiring work comes from Salvo Messina and Filippo Gravagno's analysis of industrial risk landscapes in the Sicilian petrochemical town of Priolo. While I acknowledge that Messina and Gravagno's work (2008) represent the starting point of my research, and therefore a crucial background of this research, I recognize a few points in their groundbreaking research that have not been sufficiently explored, but that I attempt to deepen more through my Ph.D. thesis. In particular, in their research, not only do they not

refer to the environmental justice legacy, but, even if they are able to emphasize the human dimension of knowledge, they dedicate much less attention to the more than human communities. This has pushed me forward further into the comparative literature review of how planning is dealing with the groundbreaking reflections of multispecies justice. Whereas some theoretical efforts can be recognized in niches of innovative and undisciplined planners, a more concrete and methodological development is still missing, as well as a more in-depth analysis of the ethical implications.

All these gaps and opportunities also find both reflections and contradictions into the main laws and normative dealing with risk, to which I dedicated Chapter 1.4. The reason why I went through some of these laws is that I do recognize that a relevant part of the planning field consists precisely in its regulations, or better, in translating values, visions, and ideas in normative terms. To look closer at the laws has allowed me to understand which are both the values underpinning those laws, and to reveal some lacking aspects that may be improved and changed. From this brief and partial journey through some crucial normative directives dealing with risk at international, European, Italian, regional, and local levels, some inductive reflections can be derived. In particular, international agreements have appealed for an integrated work between vernacular/local and expert knowledge, conceiving these merges as an essential step toward the mitigation of risk. Emblematically, many of the Sendai Framework articles are dedicated to a democratization of the construction of risk knowledge by increasing information and communication. However, it is worth noting that the Sendai Framework tackles the risk mostly in terms of evaluation and mitigation of abrupt natural hazards and disasters, instead of risk coming from slow everyday disasters. At the European level, the Aarhus convention has the undeniable credit of having formalized the importance of transparency, communication, and access of citizens to environmental data as a way to reduce environmental injustice. Similarly, the Parma and Ostrava declarations have set off, confirmed the right to access data, and emphasized, for the first time in a more institutionalized way at the European level, the inescapable nexus between environmental burdens and socio-economic inequalities permeating our society. It is worth noting that in these two declarations the risk knowledge is mainly treated in terms of improving information about risk, instead of tending to experiment with a co-production path based on including insurgent forms of knowledge into the often bureaucratic and rigid normative structure. I also delved into and unearthed a few drawbacks of the main laws concerning industrial risk in Italy e.g., the so-called Seveso directive. This latter, despite being innovative at the time of its elaboration and approval, in my perspective is limited both on the topic of public access to environmental information, and to its limited view on industrial risk as a mere accidental fact causing punctual and sudden damages. These limitations, at different scales, can be found at the regional and local levels, where the laws dealing with risk landscapes are quite traditional and characterized by a total absence of tools aimed to enable and include insurgent planning practices and knowledge into the institutionalized planning process. The management of industrial risk at the regional level is in the hands of special corps (Protezione Civile) -that treat the industrial risk in terms of accident and emergency- and in the hands of experts in ARPA that are in

charge of mainly quantifying the risk, and, furthermore, in the light of previous researches, instead of democratizing knowledge, they seem actually to act to perpetuate technocracy monopoly.

Finally, in Chapter 1.4 I went through how various fields of knowledge, such as political ecology, environmental humanities, social movement's studies, environmental justice studies, have arisen and examined the interplay between environmentalist movements, environmental injustices, and the spatialization of inequalities. All of them have the merit, in my opinion, of having nurtured fresh polyhedric perspectives, merging the environmental, the political, the socio-economic, and the situated and embedded knowledge.

The environmental discourse and practice have been conceived at length as neutral, apolitical, rather than nestled into the socio-economic structure. This has meant not taking into consideration the socio-ecological interconnections shaping, producing, and reproducing the risk landscapes. In line with many other much more qualified scholars than I, argue that the environmental justice movements and studies, as well as the political ecology, have challenged such a lack. In particular, despite the environmental justice movement, and its correlated concepts, mainly derives from the American context, however, I believe that they have contributed to unveiling and underlining the interconnections between socio-economic dynamics and the environment: a lesson that is enlightening and applicable in many other contexts worldwide, not only in the US, and in many other disciplines, including planning. Environmental justice studies have gone through several development steps and disentangled the multi-faces of socio-economic, health, and environmental inequalities. They have done this by looking at in-depth case studies or through comparative approaches. The EJ studies researchers have been observers or activist researchers and have given space to both lay knowledge and how activists construct emancipatory knowledge (e.g., popular epidemiology, toxic tours, etc.). In my perspective, they have the lack of having less questioned the epistemological attitude of scholars, above all concerning all those forms of injustice and violence occurring slowly over time and diffused over space. On the other side, the Environmental Humanities have been so far a groundbreaking umbrella field that was able to carry out "a counter-hegemonic project especially in research and writing practices, less on the level of politicization of the scientific agenda" (Armiero 2020: 30), yet this latter weakness has been the core of political ecology. PE deserves the credit of having called attention to the need of bringing back justice and political into the environment, and vice-versa and of having critically questioned which role should be the one of scholars in working together with fence-line communities.

They also have mobilized strong statements against the current disciplined, competitive, and productivist modality of making research, whereas they have much less explored what practically it means to be undisciplined and to construct collective knowledge aimed to trigger emancipatory process and more justice. If PE has contributed much in retracing and mapping the several socio-economic environmental conflicts in the world, only a small amount of its theoretical works has concerned the narrative and counter-narrative that downplay or amplify the subaltern voices, especially in those contexts of slow everyday disasters and violence.

In short, all these opportunities and gaps in the way the environmental justice and humanities, political ecology, planning field, and normative deal with the construction of risk knowledge and through which I went into these chapters, make up the starting point of the problem statement I detected in which my research work seeks to dialogue.

Problem statement and research questions

This journey through several fields of knowledge has hence led me to reformulate my research question. It is also fair recognizing that this process of re-elaboration has also been fed over time from experience coming from the field.

My starting research question (see the Introduction) was: how did the praxis of planning itself become an emancipatory process for the most marginalized, distressed, and powerless communities?

In order to answer this first question, I went through quite a variegated literature review that has led me to reformulate my original research questions.

First of all, it soon became clear that where there is an interplay between socio-economic inequalities and environmental deterioration, there is most probably an emblematic concentration of injustice. In these “sacrifice zones” there are people whose lives have been considered at length as expendable in the name of progress, growth, and profit. The fenceline communities, by being in first-person affected by the drawbacks and negative effects of massive global industrialization and extractive cycles, often organize themselves in order to seek justice, but also to scream in order to have their voices heard. Those people are custodians of a local, vernacular, and insurgent knowledge that can enlighten both about the injustice and power relations over time, as well as about the transformation of the relationship between humans and their daily life environment. This knowledge can be embedded in the human body and autobiographical stories. However, it is incorporated also into non-human bodies. This knowledge speaks about memories of inequalities, but also about sensorial experiences, as well as about the anomalies of living in contaminated places, as well as, finally, about alternative visions for the future. To include such knowledge into the way researchers, carry out their own work and, more specifically, the way planners construct their knowledge framework while they are dealing with the comprehension, evaluation, and planning of such environmentally degraded areas is still an open challenge, a field to be investigated by being undisciplined.

While from a theoretical point of view the post-normal science has already called for an “extended peer community” that involves “extended facts”, from a procedural point of view both some laws and some planning praxis have applied an enlargement of the public involvement into the decision-making processes. Nonetheless, by looking at the laws, such as the Seveso directives, it is evident that while the Seveso accident marked a turning point in risk-related issues coming from sudden catastrophic events, what about gradual,

silent, and invisible disasters, such as the ones caused by slow pollution and contamination? While some other international declarations and documents talk about information and communication, what about authentic co-production of knowledge?

In addition to the normative framework, in the academic debate regarding varied disciplines, many drawbacks can be found as well. For instance, if the landscapes can be considered as the place of people's perspective, what about non-human communities? And, more specifically, the concept of risk landscapes needs to be amplified. If all the so-far theoretical speculations on riskscapes try to entail the cultural, geographical, and spatial distributions of risk and environmental impacts, they take less into consideration the socio-economic and power structure that subtends our current risk society i.e., what is missing is a wider interpretation of landscapes in order to achieve a “just riskscapes”. Finally, the concept of riskscapes does not include all those slow-burning issues occurring over a long-time span, in a diffused way into time and space. Briefly, if landscapes embed knowledge, what must be improved is that risk landscapes embed human and more than human knowledge as well as social justice issues. To assume the risk in terms of a socio-eco-systemic territorial phenomenon means recognizing its plural dimension to be sought in the interconnections of the territory and entails a change in the planning approach to risk landscapes. While fast-moving hazards can be relatively simple to calculate through quantitative and probabilistic tools, big data, and algorithms, diffused hazards require a more complex approach that conceives risk as a socio-eco-systemic-landscape phenomenon involving human and -human communities living and interacting with the environment.

The mainstream and techno-driven approach to the production of expert knowledge on risk landscapes is not able to grasp the damage diffused over space and gradual over time i.e., “everyday disasters” (Benadusi 2018), “slow disasters” (Knowles 2014) that are slow-burning issues (Mah 2017), as well as, it is not able also to catch the insurgent forms of knowledge, the complex socio-economic and cultural dynamics, neither the injustices and power relations, neither the transformations of human and non-human communities - and of their relationships. The mainstream approach to the planning of risk landscapes does not capture the multiple ways through which the community deals with those challenges.

In other words, the BD approach to the production of knowledge instead of democratizing technologies and bridging the gap between expert knowledge and laypeople may increase it, instead of flattening socio-economic disparities it may aggravate them. As Alice Mah has argued, “...although getting better data is important for environmental justice, it is not necessarily what changes social worlds – political action is what changes things.” (Mah 2017: 130).

In my opinion, the crucial point does not regard the advancement of the BD system itself, but how the systematic delegation to expert knowledge—which often uses techno-driven and quantitative solutions—affects the way to carry on research, especially in risk landscapes. A generalized and placeless research approach, besides being a lost occasion for democratizing both technology and democracy in itself (Busacca and Gravagno 2006), is not adequate in case of “slow disaster” (Gray-Cosgrove et al. 2015; Knowles 2014).

The research questions then have turned to be, which can be new and other forms of knowledge to do research within risk landscapes? How can this knowledge be linked to the evaluation and planning of these contexts (marginal, contaminated, powerless)?

Starting from these research questions, with my work I aim to provide a re-signification of industrial risk as an emblematic example of slower-burning issues (Mah 2017) and everyday “disasters” (Knowles 2014, 2020) and slow disasters (Knowles 2014, 2018, 2020). Industrial risk and potential damage, such as toxicity and contamination, are never locationally limited and discrete – in terms of both time and space – but always invisibly and violently diffused into human and nonhuman communities living in and shaping landscapes. This entails a wider interpretation of riskscape better linking the riskscape concept to the slow violence concept. By slow violence, I directly refer to Nixon's definition of that violence occurring “gradually and out of sight”, a violence of delayed destruction that is dispersed across time and space, an attritional violence that is typically not viewed as violence at all (Nixon 2011: 2).

Also, the aforesaid shortcomings of the legislation on industrial risk with regard to the knowledge-building process and socio-environmental justice indicate which are the normative gaps to be challenged and improved or, in other words, indicate the future paths of research to be explored. I hope that my dissertation can provide a contribution to this direction.

With my research, in my humble opinion, I aspire to envision a methodological and epistemological turn that, starting from the aforesaid background and gaps, aims to reach a fairer planning whose desirable outcomes would also be an impact on the regulations regarding industrial risk at various levels of land government and spatial scale.

In what exactly this epistemological and methodological turn consists of will be unpacked in the following chapter.

**2. THE PROPOSAL OF A SMALL, SLOW, AND STREET
APPROACH
TO RESEARCH IN RISK LANDSCAPES**

2.1 The Small, Slow, and Street Approach: Toward an Epistemological Turn

This chapter digs into the epistemological and methodological features of an SSS approach. First, I will give an overview of the epistemological and cultural origins from which I took inspiration and that also constitutes the scientific foundations sustaining my proposal (from positivism to post-normal science, situated-knowledge, slow science, action-research, complexity theory, etc.). Finally, I will go in-depth into the meaning and reasoning behind each word ("small," "slow," "street").

“Why is or should epistemology be important to planners? Why should we care about the philosophy of knowledge?” (Sandercock 2003a: 60). With these questions, Leonie Sandercock starts a chapter regarding "exploring planning's knowledge". She asks this because, without having the intention of discarding the mainstream modernist and rationalist way of knowing, she aims to acknowledge the many other ways of knowing that exist.

The way of knowing has been so far the lens I used as I surveyed different fields of knowledge. It is not by chance that I ended the last chapter by proposing the following two research questions: which new and other forms of knowledge can be studied within risk landscapes? How can this knowledge be linked to the evaluation and planning of these contexts (marginal, contaminated, powerless)?

These open questions have to do with epistemology. In other words, my questions aim to investigate how new/alternative/fresh ways of knowing can improve the planning of risk landscapes. Starting from and in response to those two questions I propose an epistemological and methodological turn toward what I term a “small slow street approach” (SSS) to the study of risk landscapes in which socio-environmental issues are thickly interplayed with slow (and violent) transformations. The novelty and added value of this approach lies in the fact that, by being undisciplined and trespassing fields of knowledge and using several methodological toolkits, it merges different reflections, backgrounds and sources of inspiration. With the goal of addressing the way planning approaches unjust and contaminated landscapes in which fence-line and powerless communities live, and in which damages are often slow over time, diffused over space, and not always visible, I envision a way of constructing knowledge that may be more appropriate for dealing with the gaps that can be found in the existing ways to construct knowledge in risk landscapes (see from cap.1.1 to cap.1.5).

From an epistemological point of view, there are many approaches underpinning my line of reasoning, namely, those of post-normal science, feminist critique, complexity theory, ecology of mind, and the action-research paradigm.

As I have already partly introduced in chapter 1.2., planning (and most of the other disciplines) developed in the Age of Reason, when the scientific method of empiricism became the dominant way of knowing.

Observation, hypothesis, experiment; the search for mathematically based laws of nature; and a sharp distinction between reason and emotions—these became the defining characteristics of the empirical method which has dominated western approaches to truth/knowledge since the Enlightenment (Sandercock 2003 a: 61). This same strand of rationality is applied by experts facing how to treat and solve risks, especially environmental ones. Environmental risks pose three types of uncertainty to experts (Cramer 1987; De Marchi 2001):

- pragmatic: there is no time and insufficient resources to fully analyze the problem;
- theoretical: there is no single perspective from which to look at the problem, but a series of heterogeneous disciplinary approaches
- linked to the complexity of the problem: we find ourselves operating in an open system and not in a laboratory.

Over time science has attempted to tackle the risk by a “deselective specialization” (De Marchi 2001: 129), i.e. by drastically reducing, through sectoral specializations, the scientific community. This parceling of the knowledge in small niches generates highly specialized as well as rigid and impermeable fields of knowledge, which are unable to communicate with each other and make it difficult to take a holistic approach to uncertain issues.

Beck has coined the term “organized irresponsibility” to refer to how science deals with uncertainties. Organized irresponsibility is the system that tends to negate the existence of a new type of risk and responsibility for it. On the other hand, Beck points out that another process of organized irresponsibility is a transformation of “new risk” to “old risk” (Beck 1992). On one hand, the new risk is unpredictable, uncontrollable, on another hand, risk society tends to observe and underestimate the risk as predictable, controllable, responsible “old risk” and to make it invisible. In other words, amid uncertainties, experts apply anachronistic or inappropriate tools to face new risks. This becomes even more patent in those technocratic situations that, implying a process of social rationalization, allowed experts to gain influence in the public decision-making process (De Marchi 2001: 114). As Welsh and Wynne argue (2013: 543), the process of scientization of politics, undertaken in the name of science, has become so embedded that it is generally unremarked upon, if not invisible. And, above all, under these conditions, it becomes extremely difficult for citizen groups to question or to propose alternatives to innovations in terms other than those of science, and they may be accused of being anti-science. Expertocracy has been a contested topic since the 1970s. As a matter of fact, the uncertainties and questions which arise in the course of the interaction between science or technology and society hang on the answers to questions that can be asked of science and yet which cannot be answered by science. Alin M. Weiberg (1972) coined the term trans-science to refer to all these questions, since though they are, epistemologically speaking, questions of fact and can be stated in the language of science, they are unanswerable by science; viz., they transcend science. According to Weiberg (1972: 222)

"when we do transcend science and when it impinges on the public, we have no choice but to welcome the public—even encourage the public—to participate in the debate. Scientists have no monopoly on wisdom where this kind of trans-science is involved: they will have to accommodate the will of the public and its representatives. The republic of trans-science, bordering as it does on both the political republic and the republic of science, can be neither as pure as the latter nor as undisciplined as the former. The most science can do is to inject some intellectual discipline into the republic of trans-science; politics in an open society will surely keep it democratic". If, on one side, Weiberg (1972: 220) maintains that "scientists must exercise all the canons of scientific discipline" in order to answer such transscientific questions, on the other side, it is worth noting that he speaks of public involvement in terms of "danger".

Also, Isabelle Stengers (2018) has taken an interest in the critique of the "authoritarian claim" of modern science. In fact, she underlines the omnipresence of the argument from the authority of science, especially when "experts" are used to end a debate by authority as if there were not actually a substantial political controversy at the root of the debate itself.

Both the scientification of politics, the deselective specialization, and the organized irresponsibility reveal the limitations of the way of knowing risk belonging to the mainstream technical rationality. During the last century a crisis of scientific rationality, defined as the "Enlightenment model of science" (Irwin 1995), started to take hold. This crisis is what has stimulated thinkers such as Silvio O. Funtowicz and Jerome R. Ravetz to recommend overcoming the inadequate traditional forms of problem-solving, and, instead, adopt a post-normal science that is more able to deal with ineradicable uncertainties, especially coming from environmental and technological risk (Funtowicz and Ravetz 1993). As I already presented in chapter 1, they maintain that in the face of such uncertainties, there must be an extended peer community involving amateurs, laypeople, and practitioners. In post-normal science there is still a distinction between insiders and outsiders, based on the side of knowledge on certified expertise, on the social side on occupation. But since the insiders are manifestly incapable of providing effective conclusive answers to many of the problems they confront, the outsiders are capable of forcing their way into a dialogue. This extended peer community uses extended facts, i.e. material that is effectively introduced into a scientific debate on policy issues and which include even anecdotal evidence and statistics gathered by a community. Policy analysts regularly document how science transforms society (Funtowicz and Ravetz 1992). Less often approached is how society, by speaking back to experts, can transform science and accompanying decision-making. When laypeople "speak back" to experts and science, one thing they do is contextualize science by attempting to make it "work" and resonate with their lived experience (Gibbs 1999). This process most frequently occurs when scientists, administrators, and laypeople deliberate over controversial environmental choices. It also can occur when local people are allowed to interpret scientific understandings through their own experience.

When laypeople bring science that historically had remained in the lab into their daily lives, the information and knowledge of science must now be valid in both the laboratory and "on the street" –demanding what Gibbs

(1999), has called “socially robust knowledge”. Ideally, socially robust knowledge achieves validity through an extended group of experts, including “lay experts”, where different representations of knowledge are negotiated for their relevance to particular on-the-ground problems (Funtowicz and Ravetz 1993; Corburn, 68). All these reflections deriving from post-normal science envisage the democratization of science that represents a cornerstone of the small slow street approach.

In addition to post-normal science, another quite revolutionary epistemological bedrock of SSS comes from feminist epistemologies. Since the late 1970s, feminists have been proposing alternative theories of knowledge that legitimate women’s claims as knowers and that challenge the privileging of scientific and technical knowledge at the expense of other ways of knowing, such as knowledge-based on experience, intuition, and imagination. Among those who have tried to outline a distinctively feminist knowledge, that has been quite influential on me, there is the strong objectivity by Sandra Harding (1995) and situated-knowledges by Donna J. Haraway (1991). Strong objectivity is posited in contrast to scientific objectivity since strong objectivity takes into consideration researcher bias as something that can never really be removed. A researcher's life experience will always be a lens through which they view the world and subsequently their research. Strong objectivity then argues that there is an androcentric bias in male researchers' attempts to be a neutral researcher. Researches that are neutral and bare of doubt are not "strong enough". A better science stems from “the generative doubt” (Haraway 1991: 192), because, as Michel Callon, Pierre Lascoumes, and Yannick Barthe write (2009: 119) “nothing is more normal than scientists disagreeing with each other! Nothing is healthier than them being opposed to each other on how to conduct an experiment or interpret its results! Science is made of doubts, trial, and error, and divergent interpretations”. Therefore, “researchers should cultivate doubts, not certainties (...) the only antidote is the doubt” (De Filippo 2016: 22).

Harding, therefore, suggests researcher reflexivity or consideration of the researcher’s positionality, and how that affects their research. The concept of positionality and self-reflection, in addition, to being linked to the reflective practitioners (Shon 1983) and to the self-reflexivity academic groups of debate (Sultana 2007a, 2007b), is extremely connected with another groundbreaking concept coming from the feminist critique: the situated-knowledges. Envisioned by Donna J. Haraway, situated knowledges can be defined as a doctrine of embodied objectivity that accommodates paradoxical and critical feminist science projects. Feminist objectivity is about limited location and situated knowledge. The acknowledgment of the partiality, locatability, and critically of the knowledge entails several epistemological consequences in the way of making research, such as the contrast between on one hand the super partes, universal and powerful knowledge from “masculine dominators”, and on the other hand, the situated knowledge, welcoming toward the nuanced diversities and multiplicities, needy of positioning and locating. The idea is that “the only way to find a larger vision is to be somewhere in particular”, since “only partial perspective promises objective vision” (Haraway 1991: 190). Conceiving the “objectivity as positioned rationality” (Haraway 1991: 190) implies also a different and new awareness in making research: one recognizes the partiality of his/her/their view, guaranteeing is this way the “scientificity” and “objectivity” of her/his/their work. In Haraway's work arise argumentation against

various forms of unlocable knowledge claims and affirms that the alternative to relativism is partial, locale, critical knowledges sustaining the possibility of webs of connections called solidarity in politics and shared conversations in epistemology (Haraway 1991: 191). A commitment to mobile positioning and to passionate detachment is dependent on the impossibility of innocent “identity” politics and epistemologies as strategies for seeing from the standpoint of the subjugated in order to see well (Haraway 1991: 192). Positioning is, therefore, the key practice grounding knowledge organized around the imagery of vision. In arguing for politics and epistemologies of location, positioning, and situating, where partiality and, not universality is the condition of being heard to make rational knowledge claims, Haraway paves the way to an epistemological revolution that has been welcomed by feminist critique studies but also can be found in environmental humanities and other fields, barely inside planning. In this view, the object of knowledge are pictures and actors, and agents, while the account of a “real” world does not depend on the logic of discovery, but on a power-charged social relation of “conversation”. In her view, the body is an agent, not a resource, is an object of knowledge inasmuch it is a material-semiotic generative node (Haraway 1991: 200). While I agree with Leonie Sandercock (2003 a: 69) on the limitations she recognizes in the feminist critiques that are often constrained, therefore reinforcing it, the Enlightenment dichotomy of male/female, rational/irrational, mind/body, culture/nature, I welcome the trickledown effect coming from the feminist theories as an important epistemological reference in generating the SSS. Especially I take in how feminists insist on paying attention to the political content of knowledge creation, to the way knowledges are institutionalized, and to who benefits from the production of which knowledges., i.e. on how knowledges are connected with power, since "there's nothing more political than epistemological struggles" (Sandercock 2003a: 73).

If the topography of subjectivity is multidimensional and generates vision, the vision is always a question of the power to see (Haraway 1991: 192). Without discarding the scientific and technical ways of knowing, it is needed to acknowledge, as well, the many other ways of knowing that exist (Sandercock 2003: 76), and each of them entails different visions and subjectivity.

On the many forms in which knowledges can be expressed, Sandercock has proposed an epistemology of multiplicity, which recognizes at least six ways of knowing (Sandercock 2003 a: 76-82), to know through dialogue; from experience; from local knowledge; from reading symbolic and non-verbal evidence; through contemplative appreciative knowledge; finally, learning by doing or action-planning. The SSS approach espouses the legacy coming from the feminist epistemologies and recognizes the need for positionality in knowing, as well as the political and power implication in producing knowledges.

Another epistemological strand constituting the bedrock of SSS is the theory of complexity and the ecology of mind. Knowledge is considered as a multiform, multi-agent, dynamic disposition, being complex as it mirrors the phenomenological-relational complexity of the environment it refers to (Maturana and Varela 1987: 47-65). The theory of complexity for which it is not possible to state the objectivity of science, rather the researchers are part of the observed system. According to follow-up studies, the triad “nature-mind-

collectivity" is co-evolutional, i.e. they change one with the other over time and the mind is embedded into a thick net of ecological relations (Bateson 1972). By borrowing and adopting the theory of complexity and the ecology of mind to the landscapes design, Giorgio Pizziolo and Rita Micarelli (2003), as I already explained in chapt.1.3., proposes the "ecology of planning" for which the landscapes are "the living place of inhabitants and inhabitants' point of view". The ecology of planning involves the three ecologies of mind, nature, and collectivity and triggers a conscious co-evolutionary ecology (Pizziolo 2000: 52). According to this alternative strand of landscape design, an authentic knowledge by the planner can exist only in a process of mutual and relational modification that involves both the subject -the planner- and the object of knowledge -the landscapes, the city, the territory navigating inside a relational field. Given that the observant and what is observed are both parts of the system, then the point of view of the researcher is partial.

The last reference is the action-research theory. Assumed that the researcher recognizes herself/himself/themselves as part of the system, her/his/their own position and partiality as a strong point of scientific objectivity, in order to trigger a transformative process of the context, she/he/they will be aware of the need to be part of the context itself. As a consequence of these theoretical presuppositions, the planner is not a subject placed out of context and enclosed in her/his /their "ivory tower", from which she/he/they dispenses top-down projects, but, rather the researcher is embedded in the context of study with which exchanges a continuous flow of information, ideas, knowledge. Hence, the planner is a "practicing researcher" whose goal is to practice action research among local communities (Saija 2017). The action research somehow includes a "militant science" with the specific goals to produce knowledge that intentionally seeks to have emancipatory impacts on distressed communities.

The SSS has roots in this varied epistemological origin. SSS seeks to create an extended peer community that uses extended facts, which include even anecdotal evidence and statistics gathered by a community. SSS acknowledges the partiality and locability of knowledge, it aims to construct situated knowledges in which the body becomes an agent of knowledge. The human (and more than human) dimension of knowledges and, more in general, the insurgent forms of knowledge arising from autobiographical stories becomes a central core of this approach I propose. SSS constructs knowledge inside a relational field of co-evolutionary interactions of mind, nature and collectivity shaping the landscape. Finally, SSS aspires to be the harbinger of an action-research path. In order to understand how SSS tries to dialogue and dance with this epistemological background while it suggests a methodological turn, I will first explain the reason behind the choice of the words, "small", "slow", "street", and then I will go more in-depth into the methodological characteristics of SSS [Table 1].

The small (is big!)

In 1973 Ernst Friedrich Schumacher published his most famous book "Small is beautiful" in which he criticized the illusion of unlimited human power through big and incremental technologies and proposed

human-scale, decentralized, and “small” technologies to face the forthcoming environmental challenges. After almost a half-century, the dichotomic rhetoric small/big seems to still be key into the debate on how to face techno-environmental risks.

The techno-positivist approach has entailed extensive investment in high technologies and more recently in smart devices that allow the collection of a large amount of data, the Big Data (BD). Experts can monitor, collect, analyze, calculate, and manage millions of data that they elaborate through opaque and often unjust algorithms resembling contemporaneous oracles able to predict and shape the future (Vespignani 2019). However, more data does not automatically imply more information, more knowledge, and more justice; quite the contrary, BD can reproduce biases and injustice, or generate skepticism due to the incomprehension of the mechanism of production of knowledge. Technical and quantitative analysis are tools, no more and no less, frequently valuable, but incomplete without the richer study of human ends that they themselves cannot perform (Schön 1983). After all, as Bruno Latour (1999: 304) predicted, “the more science and technology succeed, the opaquer and obscure they become”. In this regard, Cathy O’Neil’s defines algorithms behind BD as “weapons of Math Destruction” (2016), arguing that the opaqueness of their production can have harmful impacts on the most vulnerable citizens. These criticalities have been recognized for instance by Datta and Odendaal (2019) who examine the dynamics of power in the smartification of daily life, and by Rob Kitchin (2014) who highlights that BD raises a number of concerns with respect to the politics of such data, the technocratic governance, the corporatisation and further neo-liberalization of city management, the validity of analytics. In other words, BD approach to the production of knowledge instead of democratizing technologies and bridging the gap between expert knowledge and laypeople may increase it, instead of flattening socio-economic disparities it may aggravate them. As Alice Mah (2017: 130) has argued, “although getting better data is important for environmental justice, it is not necessarily what changes social worlds – political action is what changes things.” Similarly, Heather Campbell affirms “the just is not determined by an algorithm, particularly with respect to a situated activity such as planning” (Campbell 2006: 101).

In my opinion, the crucial point does not regard the advancement of the BD system itself, but how the systematic delegation to expert knowledge – which often uses techno-driven and quantitative solutions – affects the way to carry on research especially in risk landscapes. The BD approach is not able to catch the human (and more than human) dimension of knowledge, to map the social tensions shaping the community and power dynamics, especially wherein there are powerless and subaltern populations struggling with dominant actors, to comprehend the transformations of the relationship between human and environment. Communities criticize risk assessment because it tends to rely on quantitative data over the experiences of those living with persistent pollution. However, quantitative analysis often leads to what Tribe (1972) called the “dwarfing of soft variables”, i.e. information that cannot be quantified is not considered, and conclusions are biased toward considerations that the quantification process can incorporate.

As an alternative to expert knowledge on risk landscapes built on techno-driven and big data tools, together with Marco Armiero and Filippo Gravagno (Privitera et al. 2021), we have proposed tools such as small data and autobiographies. We define small data as the ensemble of information – we would prefer to call it “stories” – embodied into the texture of life of human and non-human communities. The differences between small and BD are epistemological, “ethical,” and methodological. While BD are recurring, generalized, and impersonal, small data are discrete, specific, and personal. While BD can be collected through technological devices, small data arise through emotional and sensorial experience, i.e. fieldwork and direct interaction between the researcher and the context. I argue that small data enable the understanding of the dynamics of the transformation of places. They unveil qualitative information about the everyday relationships between human and non-human communities and the environment, and the transformation of such relationships over time. Small data pay attention to all those “symbolic forms” (Sandercock 2003 a: 79) that can help people and planners to connect emotionally to a particular environment, and to come together in a non-confrontational way to explore solutions to a complex set of problems. Small data ground on the idea that “nothing you see or hear is irrelevant or wasted.” (Lindstrom 2016: 206).

Small data can be collected from the toxic autobiography of a worker, the stench occupying a neighborhood, and the color of a seashell are all examples of what we mean by small data. Some of those stories are told by humans – as for instance in the Toxic Bios project –, others are inscribed into the environment. When small data come from toxic autobiographies, they interplay with an already quite consolidated tradition regarding storytelling and oral histories.

Environmental oral histories are already used within the fields of environmental humanities and history. They provide materials on individual experience and the ideologies which shape environmental subjectivities, as well as situated accounts of environmental change that provide a distinct, often embodied, insight into past and present environments in terms of practices, identity, and knowledge (Williams and Riley 2020). Storytelling has been massively applied in sociology too. An example is the active narrative' approach by David N. Pellow (2003). Drawn heavily from Weinberg's (1994) concept of a 'sociological narrative,' as well as from research on history as storytelling (Cronon 1992), Black feminist theory (Collins 1991; Crenshaw 1993), and advocacy research (Park and Pellow 1996; Stoecker and Beckwith 1992; Stoecker 1996), the active narrative approach calls for direct participation in the worlds of our informants. It means that that researcher observes the successes and failures of the movement from 'within' so as to offer insider perspectives with the intention of improving the possibilities of realizing effective social change. Weinberg (1994: 32) writes that the sociological narrative" entails the use of pragmatic philosophical skills to tell stories that engrossingly and persuasively convey central themes that represent what has been missed by others." This narrative is a way of creating “...alternative versions, which challenge readers to examine their belief structures” (ibidem) to the extent that it is "possible to narrate the same evidence in radically different ways" (Cronon 1992: 1370). The

role of the narrative in sociology is that it remains but one method whereby a story or multiple stories can be told, without privileging one voice over another.

Although directly connected to oral history practice, toxic autobiographies slightly differ from it. They assume the centrality of the body and the bodily experience in understanding the world and the place of the storyteller in it; they are clearly placed in opposition to what we have been called “toxic narratives” because whilst the latter aims to silence and normalize injustice, toxic autobiographies fight for making it visible, transforming an individual experience in a collective cry for justice. Although for this article we have focused on toxic autobiographies, we also acknowledge other ways in which people can experience risks, including silence, when no opportunities for expressing disagreement is ensured (Callon 1999, 88); acquiescence, interpreted in terms of tactics and strategy (Lukes 2005, 129); and forms of intimate (Tironi 2018) or resigned activism (Lora-Wainwright 2017). Storytelling has recently received growing attention not only in environmental humanities studies but also in planning, in the latter both as a model of the way planning is done and as a model for the way planning could or should be done (van Hulst 2012). According to Leonie Sandercock (2003b: 11), stories can improve planning in at least three ways: by expanding planners’ practical tools, by sharpening planners’ critical judgment, and by widening the circle of democratic discourse. The ability of a practitioner consists of making the space for stories to be heard, especially in situations where deep histories of identity and domination are the context through which a present dispute is viewed. Small data and toxic autobiographies, by potentially acting as “catalysts” for change and social empowerment (Sandercock 2003 a: 192; Sandercock 2003b: 26), are in line with the debate on storytelling in planning. The collection of “stories of landscapes” (Gravagno and Messina 2008) generates plural perspectives on landscape and allows detection of the social perception of risk and the history and identity of a place. In addition, they tackle the gap between techno-driven and local knowledge, since they bear witness to dynamic interactions of humans and more-than-human communities, enlightening how they have changed over time and gathering information that technological devices are unable to collect. As a matter of fact, technocratic approaches seem more inclined to reproduce and/or adjust the status quo rather than radically challenging it; radical transformations are more frequently enhanced by hybrid alliances of experts’ and citizens’ knowledge. In other words, small data and toxic autobiographies are tools for the production of knowledge that aim to enhance the collective creation of new visions for a community. While the qualitative approach widely practiced within the social sciences (Marradi 2005; Della Porta and Keating 2008; Della Porta 2014) has mostly a descriptive nature or, at most, it mixes with socially engaged research, small data and toxic autobiographies intentionally aim at fostering the transformative action of the community. Then, the essential distinction between qualitative analysis and our proposal lies in their different final goal.

In short, I utilize on purpose the word "small" in order to give emphasis to all those aspects of knowledge that are tiny, sometimes invisible or difficult to reach and interpret, but also partial, personal, often deeply intimate. In light of the journey through environmental humanities and justice studies (1.4.), and planning (chapt. 1.2.,

1.3.), I do believe that precisely these small features of knowledge can be illuminating in understanding, and hence acting, within risk landscapes where transformations have occurred in silent violent ways over time and space. The small dimension of knowing cannot be intercepted through the mainstream tools so far applied, instead it needs new tools. I defined these novel tools "small data". Nonetheless, at this point it is worth recognizing the concept of small (and of small data in particular) is not exactly news.

In addition to the beauty of smallness invoked since the '70s by Schumacher, the potential role of small has been the protagonist of a relatively few works. A very inspiring referent for me has been the groundbreaking ethnographic methodological proposal developed by the market-analyst Martin Lindstrom. In "Small Data: The Tiny Clues that Uncover Huge Trends" (2016) Lindstrom explains how to get clues on how people's lifestyle may affect their consumption behavior by using small data obtained by spending time with 2,000 families in more than 77 countries. Small data includes everything from Snapchat to simple objects such as the Post-it note. Lindstrom believes we become so focused on big data that we tend to forget about more basic concepts and creativity. Lindstrom defines small data as seemingly insignificant observations you identify in consumers' homes. He asserts that one should perfectly master the small data in order to mine and find correlations. According to Lindstrom (2016: 202) "as accurate, then, as big data can be while connecting millions of data points to generate correlations, big data is frequently compromised whenever humans act like, well, humans". However, Lindstrom acknowledges that "big data continues helping us cut corners and automate our lives, humans in turn will evolve simultaneously to address and pivot around the changes that technology creates". Lindstrom has even attempted to elaborate a methodology, the 7Cs framework, standing for Collecting, Clues, Connecting, Causation, Correlation, Compensation and Concept—that better allows a "dance between big and small data" (Lindstrom 2016: 202).

Although Lindstrom's small data are intrinsically linked to qualitative ethnographic data, the finality could not be more different from the one belonging to SSS, i.e. I just borrow this definition and mostly re-mean it. The first is connected with the attempt to better analyze consumer trends in order to command product markets, whereas I am concerned with the knowledge embedded in the lives, bodies and experiences of human and more-than-human communities, with the final goal of enlarging and improving the way knowledge of risk landscapes is constructed. Finally, the concept of small data should not be confused with "small big data," (Gray et al. 2015) which is one of the most successful uses of big data for understanding environmental exposures and involves the analysis of a very big but conventional data set. These are small data that are also small, or more conventional. This concept is distant from the human (and more-than-human) dimension of knowledge that characterizes small data, instead it is quite close to the most unpolitical form of citizen science

In short, the small is big because it allows a more complex but also complete comprehension of the risk landscapes. It leads to a way of constructing knowledge that incorporates multiple layers of human and more-than-human knowledge, including those sensorial tiny data that may be telling of past memories, present challenges, and future visions.

The slow (is effective!)

In 2007, the renowned Italian artist Franco Battiato was singing “Vacuum”, considering it both in terms of space and time, referring to the vacuumlike the one stemming from the superficiality and frivolousness of our (pre-COVID19) delirious society, and using sentences like the following:

“Time there is no time, more and more anxious

I chase our time empty of meaning, sense of empty

And people, how many people, a sea of people in a vacuum”

I am fascinated by how the pandemic has undoubtedly interrupted such voids coming from a frenetic lifestyle, but meanwhile, it may have created other ones. I called it the “horror (space and time) vacui” (Privitera 2020) while I was analyzing the temporal-spatial effect of the pandemic in Catania (Sicily, Italy). Our globalized capitalistic society has a fast rhythm, the one who hesitates is lost,—even more in academia, where the one does not publish, perishes. This is a famous saying, above all among Ph.D. students. In the research world, usually a fixed period of time is available that is relatively brief, and this is even more the case if one is still a young scholar without a tenure position. In this case, one must collect as much data as possible and generate as many ideas, papers, publications as possible in the shortest possible time.

Even if I may agree that to write under pressure and with upcoming deadlines can sometimes encourage keeping a precise roadmap and that the competitiveness spurs our best skills to come out, nevertheless, since the beginning of my PhD journey I felt uncomfortable with this time-diktat. This was especially true when I started my fieldwork in Gela, where multi-layer quantitative and qualitative transformations have occurred over the *longue durée* as well as in a short time span, and sometimes in invisible and/or conflicting ways (Morpugno et al. 2021). To get an authentic and deep engagement with people, to catch and to comprehend all those tiny and small peculiar nuances of the place, and to map the insurgent forms of knowledge—all these take time, qualitatively and quantitatively speaking. While I was living this awkwardness in trying to extract as much as possible knowledge from the fieldwork within the scarce time that the academia granted to me, I find comfort in previous thinkers who, most probably, felt a similar distress and envisioned alternative paths to approach the production of knowledge by calling for slowing down. I will contextualize this call both epistemologically, politically, and methodologically below.

A first fundamental reference is the slow science movement that, as part of the broader slow movement, is based on the belief that science should be a slow, steady, methodical process, and that scientists should not be expected to provide “quick fixes” to society's problems. Slow science, in arguing that “science needs time” (The Slow Science Academy 2010: 1) supports curiosity-driven scientific research and opposes performance targets. Within the academic debate, slowness has assumed several meanings

A more political call for slow scholarship against the competitive and productivist fast academia has been developed from feminist critique. In this case, the slowness has been developed as a feminist politics of resistance through collective action in the Neoliberal University (Mountz et al. 2015). In other words, slowing down involves resisting neoliberal regimes of hurried time by working with care while also caring for ourselves and others. A feminist mode of slow scholarship works for deep reflexive thought, engaged research, joy in writing and working with concepts and ideas driven by our passions. Slow scholarship has value in itself because it enables the creation of the quality of research and of the writing produced, as well as of a humane and sustainable work environment and professional community that allows people to thrive within academia and beyond.

A political and epistemological slowness is present in the Slow Science Manifesto, according to which “science [is] at the service of society as a whole” (The Slow Science Academy 2010: 1). The topic of the interaction between society is also the core of a further important work on slowing down science, that is “Another Science is Possible” by Isabelle Stengers (2018). According to Stengers’ provocative “plea for slow science”, academicians should reclaim the practice of slow science, taking the time to ask questions and mull over interpretations, rather than churning out fast results. For Stengers, slow science is not about returning to the (fast science) golden era where scientists were autonomous and respected, but about creating a collective awareness and appreciation for Society among scientists (i.e., for them to “become civilized”). As a matter of fact, Stengers argues against Science’s technocratic mindset and in favor of Society’s democracy, which needs from Science contextualized answers to its social concerns and the cultivation of public intelligence of connoisseurs. From her perspective, “slowing down means becoming capable of learning, again, becoming acquainted with things again, reweaving the bounds of interdependency” (Stengers 2018: 82). Namely, it is not about another science, but about contemporary science communicated and applied differently, with more attunement to Society’s milieu. Finally, with a more political purpose, Stengers brings her epistemological slow science plea to academia, and tasks the university with creating a future for slow science. In a nutshell, Stengers mobilizes slowness both to politically attack how the fast, quickly prepared science is positively evaluated within the current university system and to epistemologically critique a way of constructing knowledge without searching for any intertwining with social interests, especially within hard science.

Similarly, Kyle Whyte (2020) stands against the “crisis epistemology” that involves knowing the world in such a way that a certain present is experienced as new. In such crisis epistemology, newness is discussed in terms of the presumptions of unprecedentedness and urgency. He demonstrates how this emergency narrative aims to blur the colonialism and power structure underpinning the climate change discourse. The crisis may be articulated as related to many imminent problems, including health, economic well-being, environmental sustainability, cultural integrity, and religious salvation: all horribly harmful or inequitable facts whose possibility to occur actually impedes people's understanding of the present conditions they are living in. These imminent events suggest the need to immediately become solutions-oriented in a way believed to differ from

how solutions were designed and enacted previously. As an alternative to the epistemology of crisis, he proposes an epistemology of coordination, which refers to ways of knowing the world that emphasize the importance of moral bonds—or kinship relationships—for generating the (responsible) capacity to respond to constant change. Epistemologies of coordination are conducive to responding to expected and drastic changes without validating harm or violence. Rooted into the indigenous families of thoughts, it approaches the knowledge by looking at the world through kin relationships, emphasizing the role of the interconnection between human and more-than-human communities. The epistemology of coordination is, therefore, from my perspective, intrinsically a slow epistemological proposal that is also much more sensitive and willing to embrace a multispecies, slow way of knowing.

Closely related to these reflections, Alice Mah (2017: 130) proposes the idea of "slowing the approach to environmental issues," especially with reference to the way of knowing them through big data. Although many proponents of big data emphasize the importance of the capacity to act in the present and the environmental justice movement, with its long tradition of innovative citizen–expert alliances, has started to engage with new big data techniques, tools, and technologies, she points out that there are (at least) three counterpoints to the hype about the velocity, volume, and variety of big data. In fact, if much of the hype around big data focuses on its velocity and, in particular, in its capacity for generating data in real time, Alice Mah (2017: 126) has identified the “speed” as one of the keys “toxic blind spots” in relation to environmental justice. By privileging the speeding up of time and space in the global era—what Harvey (1989) calls ‘time-space compression’—big data might overlook the gradual actuality of toxic experience. This is why Alice Mah calls for slowing down in dealing with slow-burning issues. As she sustains (Mah 2017: 130) “slowing would entail a shift of analytical focus, emphasizing a greater attentiveness to questions of visibility and voice, looking not only at the loudest voices or the problem of the digital divide, but more structurally at the mechanisms of exclusion.” Following a fast-paced approach to big data risks reproducing, or even exacerbating, patterns of invisibility and exclusion. “The challenge of making environmental exposures visible is not only about making more voices heard, although clearly this is an important and integral part of the struggle. It is also about questioning patterns of how, why, and what voices can be heard” (Mah 2017: 130).

Slowing down would also involve looking at slower, and less acute, time scales of environmental hazards, focusing not only on cases of crisis but also on slower-burning issues that are more difficult to measure, whether with conventional methods of science or with new techniques of big data. According to this perspective, slowing would involve taking a pause before embracing big data and examining its vested interests, loaded associations, and limitations, both politically and scientifically. Slowing down environmental analysis and reasoning would allow thinking more critically and reflectively about the framing of complex environmental challenges, given that knowledge controversies are generative events thanks to their potential to foster the disordering conditions in which reasoning is forced to ‘slow down,’ creating opportunities to arouse “a different awareness of the problems and situations that mobilize us” (Whatmore 2009: 588). Echoing

Sarah Whatmore's (2009) call for "slowing down collective reasoning" in order to make a difference upon the framing of environmental concerns, Adam calls for adopting a clearer "temporal gaze" (Adam 1998; 2000). According to Sarah Whatmore, "slowing down is achieved by working with various 'things' that serve to objectify the knowledge claims and practices of different members of the group—from photos and video footage brought and/or produced by local members to computer models and policy documents brought and/or produced by university members." This "objectification of knowledge" makes them sensible and knowledgeable collaborate in interrogating environmental expertise, 'slowing down' reasoning and making a difference to the framing of environmental issues (Whatmore 2009: 595).

In regard to the environmental issues, I am on the same page as Alice Mah when she maintains that "yet most toxic exposure cases are slow-burning and unspectacular, beyond the scales and frames of analysis of fast-moving media or science" (Mah 2017: 127). Therefore, I do believe that slowing down both epistemologically and methodologically allows researchers to tune into the rhythm of the violence occurring slowly in risk landscapes.

What is said above is indissolubly connected with another cornerstone of slowness that is "Slow Violence and the Environmentalism of the Poor" by Rob Nixon (2011). As I have already mentioned in chapter 1.2., Rob Nixon calls attention to the "slow violence" of environmental injustice defined as "a violence that occurs gradually and out of sight, a violence of delayed destruction that is dispersed across time and space, an attritional violence that is typically not viewed as violence at all" (Nixon 2011: 2). By embracing the concept of place as "a temporal attainment that must be constantly renegotiated in the face of changes" (Nixon 2011: 18), the comprehension of the violence, that shapes places more or less invisibly, incites to find new ways "to devise arresting stories, images, and symbols adequate to the pervasive but elusive violence of delayed effects" (Fortun 2012).

Speaking of which, I agree with Thomas Davies when in his analysis of slow contaminated places, both in Chernobyl (Davies 2013) and in the Cancer Alley (Davies 2018, 2019), he suggests that these narratives, images, and symbols are already present within the communities affected by pollution, and precisely through the lived experiences of communities these narratives may be slowly observed.

It is what Thomas Davies name "the slow observations" (Davies 2018, 2019) that allow to see the "deferred casualties" (Nixon 2011: 61) of toxic spaces through which to gradually perceive – if only partially – slow violence taking place. Slowing down observation might not produce radical political change, but—like other small acts of resistance (Lora-Wainwright 2017; Pottinger 2017)—can contribute to achieving environmental justice and can offer potential openings to "unsettle the intimate impacts of toxic exposure" (Bagelman and Wiebe 2017: 83). Highlighting these visual, embodied, and lived experiences of toxic places puts the perspectives of people who co-exist with pollution at the center of accounts of slow violence. Therefore, as I have partly already explored in chapter 1.4, Thomas Davies (2018) has delved into and envisaged the

methodological meaning of slowness by proposing an ethnographic interpretation of it linked to the fieldwork in slowly contaminated places.

My conception of slowness, albeit is widely rooted into the political and epistemological declination coming from both feminist critique, epistemology of coordination and Stengers and Whywhore's works, tends to a re-signification of it in practical and methodological terms. In particular, slowing down observation grants the time of knowing and understanding of places and their human and more-than-human communities. It is effective because it gives qualitative and quantitative time both to the researchers and to the places to uncloset and share memories, emotions, data, and knowledges.

In this sense, a slow approach is, for definition, an anti-extracivist practice of knowing (Privitera 2021b) nestled into a relational field of mutual reciprocity and care with the contexts in which the researcher operates.

To this stimulating constellation of literature on slowness of science, I hope to give a methodological contribution by proposing a methodological turn, the SSS, that gives attention to *long duree* phenomena, from the past to the future, to overcome the emergency narrative, to use an approach of coordination able to grasp the time-span changes. My effort is towards methods and devices to be applied into planning processes in a manner that allows for a painstaking working-through of these challenges and conundrums, which are in themselves unsolvable in abstraction but always can be concretely actualized in relation to specific events and episodes of planning.

The street (is relevant!)

Between the main references of SSS approach, I have indicated the feminist critique that invites for the recognition of locability as a determinant prerequisite for engendering situated knowledges. To acknowledge one's own position has simultaneously a cultural, personal, geographical value and entails a deep connection with the place that is the object of study. A generalized and placeless research approach, besides being a lost occasion for democratising both technology and democracy in itself (Gravagno 2011; Busacca and Gravagno 2006), is not adequate in case of "slow" (Gray-Cosgrove, Liboiron, and Lepawsky 2015; Knowles 2014) and "everyday disaster" (Benadusi 2018). On the contrary, a way of knowing that is interrelated with position leads to a deeper exploration of the "identity of place" (Decandia 2000), and of the local knowledge of people living in that place that cannot be caught without direct contact in the field. In the SSS approach, the word "street" refers directly to Street science by Jason Corburn (2005) according to which street science is a process that emphasizes the need to open up both problems framing and subsequent methods of inquiry to local knowledge and community participation. For Corburn, street science is a practice of science, political inquiry, and action. It is a public process that originates and has meaning within a particular community (Corburn 2005: 44). However, street science is not merely a set of methods and techniques that anyone can learn with enough

attention and practice, rather, it is as much a process as it is particular information. Differently from Corburn -who defines street scientists as all those organized communities who have mobilized their own knowledge - included the fundamental knowledge of geographic places- shifting the environmental discourse from protest and refusal to engage with problem-solving – I use the term “street” by giving it a slightly different meaning. By giving for granted the importance of local knowledge, my concern is how researchers, and more specifically planners, can observe, map, comprehend and incorporate insurgent forms of knowledge in constructing knowledge about risk landscapes. My methodological focus hence moves from the population to the researchers who, in order to carry a slow observation that allows them to catch and collect small data, needs a street approach that is made of authentic and in-person interactions.

In line with the invitation to apply an “urban planning done with feet!” -a famous expression by the Italian urban planner Bernardo Secchi, coming from a series of conferences and open lectures (2012-2013)- SSS is linked with a first-hand experience of places. Similar to Edmund Husserl’s phenomenology conceives as “the reflective study of the essence of consciousness as experienced from the first-person point of view” (Husserl 1970), the “street” of the SSS approach takes the intuitive experience of phenomena as its starting point and tries to collect from it the essential features of experiences and the essence of what we experience.

There is a quite wide literature concerning the relevance of the spatial/geographical position in the way of knowing. For instance, Evans and Jones (2011) have devised a walking interview carried out by residents and/or activists. They confirm how mobile interviews engender more place-specific than sedentary interviews and produce a decidedly spatial and locational discourse of place, which is “structured geographically rather than historically” (Evans and Jones 2011: 856) The relationship between what people say and where they say it is flourishing, while the qualitative and quantitative differences between data generated by walking and sedentary interviews are patent. The data generated through walking interviews are profoundly informed by the landscapes in which they take place, emphasizing the importance of environmental features in shaping discussions. What I want to underline is how the methodology of walking interviews confirms the dense connection between position and knowledge in order to retrace more complete and complex cartography of situated and georeferenced knowledge. It is worth pointing out that experiencing firsthand -i.e. literally making research on the street- should not be confused with anyway fascinating literature regarding the esthetical act of walking as a way to enjoy the “walkscapes” (2017 [2002]). Instead, the street is scientific because it is apt to listen, catch, map, and enables the insurgent forms of knowledges also wherein powerless communities are not able to mobilize their local knowledge to unveil injustice and make their struggles more effective.

In such situations, a SSS approach may be appropriate to delicately enter into a distressed community with the precise goals to work with it by valorizing the human and more than the human dimension of knowledge.

2.2 The Small, Slow, and Street Approach: Toward a Methodological Turn

In this chapter I will explain the methodological implications of a small slow street approach.

In the previous chapter, I explained the epistemological roots, supported by the literature review, of the triad of words I decided to use, "small", "slow", and "street". In this following section, I want to better explain what an SSS approach entails methodologically and what it strives to achieve.

About the practical and methodological level, the theoretical/epistemological frame underpinning the small slow street approach to research within the risk landscapes, first, implies disciplinary osmosis that means to be undisciplined by trespassing the strict divide between disciplines. More in detail, Filippo Gravagno and Salvo Messina (2008) defined "osmotic borders" as borders that exist but are not intended only as something that divides but also as something that unites. This reminds me of the difference between "limes" and "limen". Both have the same Latin etymology; however, they differ from each other. The first means "barrier", the second means "threshold". In this sense, an undisciplined interpretation of borders recognizes the disciplinary boundary not as a constraint, but as a threshold to attend, as a border from which to exchange and enrich oneself with new knowledge and ideas and, above all, with disciplines other than urban planning, but with which one shares the same field of action. Among these disciplines, there are ecology and sociology, as well as environmental justice, environmental humanities, and political ecology that I have more specifically scrutinized in this research (see chapt 1.1 and chapt. 1.2). This is consistent with the six ways of knowing by Leonie Sandercock (2003a: 76-82), especially the one occurring through dialogue, above all the dialogue between disciplines. Disciplinary osmosis leads to the "orchestration of sciences" (Neurath 1973) that recognizes and tries to reconcile the contradictions that arise between disciplines dealing with the different aspects of ecological sustainability. According to Joan Martínez Alier (2009 [2004]) it is necessary to simultaneously consider the different forms of knowledge, appropriate to the different levels of analysis. It is, therefore, necessary to move within a holistic and "consistent" framework between the different sciences. Consilience is described as "the inference that occurs when an induction, obtained from a class of reality, coincides with another induction, arising from a different class of reality. The final purpose of consilience is the unification of knowledge founded on speculations coming from different disciplines" (Martínez Alier 2009: 58 [2004]). Furthermore, disciplinary osmosis is consistent with the call by Marco Armiero, Stefania Barca, and Irina Velicu (Armiero et al. 2019b) for being "undisciplined". Moving towards disobedience against the command to keep inside your own field of knowledges, on contrary, the SSS pushes to freely navigate between different forms and ways of knowing, to contaminate expert, lay and vernacular knowledge (Privitera 2021a), soft or hard science knowledge, through dialogue, experiences, direct engagement and stories (Sandercock 2003b), included toxic autobiographies (Armiero et. al 2019a). The aim of the SSS is the one of being "methodologically promiscuous" (Nixon 2011: XII) as a manner to catch the several and varied

knowledges. In fact, an undisciplined researcher not only dwells on the border between disciplines, but also blurs the divide between forms of knowledge, including all those in the middle between expert and local expert ones. Previous studies have questioned how to better integrate local street science into the expert one. For instance, Jason Corburn's definition of "jazz of practice" refers to when "professionals bring their conventional "tool kit" (...) their disciplinary methods, but they [professionals] also must learn and respect the rules and norms - the everyday rhythms- of the cultures and communities with whom they work". Also, in the jazz of practice, "professionals are expected to situate themselves in this struggle and make this a centerpiece of their work" (Corburn 2005: 2015). According to Jason Corburn, professionals ought to become, borrowing from Donald Schön (1983), "reflexive practitioners" who must make new commitments in their work in order to understand the insights of populations suffering from disproportionate environmental exposure and disease burdens and to enable the work of the street scientist. In the jazz of practice, professionals will bring their conventional "tool kit" but be rewarded for improvising and being creative. They also will be encouraged to forge new partnerships and to be open to new interpretations of seemingly routine situations. Stemming from this methodological experimental anterior works, SSS aims to collect small data, through intense fieldwork and active listening, through which to recognize, map, and valorize the insurgent forms of knowledge that are present in distressed risk landscapes and it does this with the goal of creating that relational field within which recognize and enable the insurgent knowledges and practices.

In practical terms, a SSS approach to the risk landscapes involves the social actors, above all the subaltern and weak ones, by using the storytelling as a tool for mutual learning, for sharing scientific and local knowledge, for collecting and confronting practices and desiderata. More specifically, one of the main methodological tools will be the collection of oral stories and ecological-no directive-interviews (Gravagno and Messina 2008) - so defined because they are aimed at creating a bond of mutual exchange between the interviewee, researcher, and reader. Narratives are ways in which people often give meaning to their experiences and events. Storytelling allows the construction of a collective history and story of the landscape transformations (Gravagno 2008) and can be a "catalyst for change" (Sandercock 2003 a: 192). The stories can be useful tools for the empowerment of local communities. Among the possible stories, special attention will be given to toxic autobiographies (Armiero et al. 2019a). The SSS seeks to experiment with a qualitative storytelling approach with the following goals: to co-produce a counter-narrative and a guerrilla narrative that wants to sabotage the toxic narrative centered on structural environmental injustice; to uncover, gather, and make visible stories of contamination and resistance. With reference to the frame of the trans-corporeality theory (Alaimo 2010), and to the theorization of slow violence (Nixon 2011), the toxic autobiographies (Newman 2012; Armiero et al. 2019) become also a tool for untangling the asymmetries of socio-economic power underlying the transformation of the territory, for telling the right story (Barca 2014), for understanding the unequal socio-economical configurations and for revealing the porosity of human/nonhuman ecologies. Especially the ill bodies are not only a natural and biological fact but a political one since they can be converted into an arena conflict (Armiero and Fava 2016: 79). The toxic autobiographies, therefore, shed light on the bodily experience

of toxicity and injustice in a contaminated place. They aim to specifically create a counter-narrative of resistance and to sabotage the toxic mainstream narrative. After all, as bell hooks (1994) affirms, "subversive historiography connects oppositional practices from the past and forms of resistance in the present, thus creating spaces of possibility where the future can be imagined differently". In this sense, toxic autobiographies and oral stories have the power to be politically engaged and to spawn creative visions for different futures (Privitera 2021b). A key point of the narratives indeed stays in its potentialities towards the co-design and co-production of knowledge and the recognition of storytelling as a fundamental tool in this process for envisioning and planning differently a specific territory. Therefore, the collective narrative facilitates the involvement and engagement of the local community in imagining a new alternative, the increase of social engagement can spawn new collective subjects and then new collective capabilities. The narrative can play an important role in supporting the resistant capabilities and for converting them into resilient and proactive capabilities. Since the collective capabilities are a horizontal instrument exercised by a collective subject that can contribute significantly to democratic empowerment (Rosignoli 2018: 824), the collective capabilities are also a significant goal and tool for planning risk places in line with what has been requested by the Sendai Framework.

The vision of changes always contains political values. Again bell hooks writes (1990: 152) "spaces can be real and imagined. Spaces can tell stories and unfold histories (...) the appropriation and use of space are political acts". Or again, "the power of the story, beyond the element of hope, is precisely the kind of comparative political thinking that it can generate" (Sandercock 1999: 45). Despite the centrality of storytelling originating from the reflections of Sandercock, in SSS they differ from her in the application of storytelling, in her cases, applied to the multicultural cities, in SSS specifically applied in riskscape.

The stories of the territories, moreover, tell us that more forms of extractivism and more ways to overcome them can be recognized. A literal extractivism, an extractivism understood as a model of society, and an extractivism of knowledge. The first touches and alters the metabolic cycles underlying the human-ecosystem relationship and consists in the physical and systematic subtraction of resources by private, state and financial interests to the detriment of local communities and the environment on which they depend. The second interprets extractivism as a model of society (Zibechi 2016) in which all the processes of expropriation and ecosystemic and social devastation are part of the accumulation mechanism for dispossession typical of financial capital (Harvey 2004). In this case, extractivism, conceived as the indispensable piece to ensure the constant economic growth required by today's dominant global capitalism, can be effectively summarized in the syllogism: without growth, capital does not accumulate, to grow it is necessary to extract, so we extract!

The third concerns the epistemological and methodological aspects with which both hard and soft sciences build knowledge in an extractivist way, that is, considering petrochemical cities, mining areas, or areas destined for massive infrastructure as "laboratory cases" to be probed, analyzed in-depth for extrapolating the functional

data for the success of one's fieldwork without setting the goal of creating authentic spaces for dialogue and osmosis between knowledge. SSS is founded on reciprocity and care with local communities.

Narratives through oral stories unveil and corroborate that local knowledge is not systematized, centralized or static, but is fluid and transforming, always partial and imperfect, constantly renegotiated among those who group it (Hawaraway 1991). In this sense, storytelling helps to conceptualize local knowledge as a set of narratives, tools, and practices located in a particular place, culture, or community.

Furthermore, the SSS approach recognizes that risk landscapes embed a spatial dimension of knowledge. This is why from the small data it is possible to comprehend human and non-human dimensions of knowledge that can be mapped and georeferenced.

Oral storytelling is often the medium through which community members express, make sense of, and understand the relationship between their life and the health of their community (Shiva 1997). This can be made explicit through evidence from local time-honored traditions, intuition, images, pictures, oral storytelling, or narratives (Corburn 2005: 60). For this reason, the SSS approach integrates knowledge and also implies the use of several sources of knowledge, from dossiers on public health to epidemiological studies, from ministerial reports to testimonies of life, from small data coming from objects and photos to the one coming from the local art production.

Such kind of engagement needs a long phase of fieldwork by researchers during which they put in practice the active listening of territory (Sclavi 2003, 2007), and the idea of "urban planning is done by feet". Only through qualitative research of participant observation, fieldwork, active listening, and interview is it possible to intercept all those small data that unearth the alteration of the ecological relations between humans, nonhuman and environments, unveiling the effect of contamination.

The SSS, in line with what Maria Kaika (2019: 264) defined as a "scholarship of presence," that takes seriously emerging practices and alternative radical imaginaries that demand or enact socio-environmental change, pays attention to all those insurgent practices. But, even more, such a kind of approach implies a "position" of the academic world intentionally aimed at improving the social context. To this regard, the aforementioned Sendai Framework and the 15 Proposals of the Forum on Inequalities and Diversity identify the academic world as a strategic and fundamental actor for reducing risk and increasing social justice by practicing the third university mission (Proposal n°4.)

Once I went through what SSS approach means methodologically, I will now stress which objectives may be achievable through it.

As I aim to demonstrate in the following chapters, a small, slow, street approach is able to unveil memories of injustice and of smell, relational and trans-corporeal stories and to create a new alternative history and vision of a territory, tracking down the historical roots of the socio-ecological crisis of a place, but also making

possible a new reading of the current transformations, by also envisioning future perspectives. In this research I seek to illustrate how my proposed approach makes it possible to map the geographies of community reactions, interplaying them with the planning vicissitudes. It also makes more complex the dichotomous distinction between institutional planning and grassroots movements.

The SSS approach through small data is moreover, and above all, able to draw attention and unearth the multispecies injustice told by vegetables and animals populating contaminated ecosystems.

In this sense, small data reveal “stories of extractivism” (Privitera 2021a) and “stories of the wasteocene” (Armiero et al. forthcoming). Nevertheless, they collect plural knowledge (Gravagno and Privitera 2020; Privitera 2021b), point up and support also “stories of communing” (Armiero et al. forthcoming) for “overcoming extractivism” (Privitera 2021a).

SSS, in doing so, is able to bring to light all those conflictual ties underpinning the risk landscapes. The SSS approach also incorporates a spatial dimension as a result of the geo-referencing of small data, which often are able to find out mismatches and anomalies, otherwise impossible to be recognized.

SSS approach turns out to be an interesting stimulus for the decision-making process in risk landscapes. By challenging the idea of a "rational decision-maker", who usually takes decisions in a context with fewer expectations and motivation and by relying on rational reflection on pros and cons, the SSS approach can rather facilitate the establishing of an "impressionistic decision-maker" (De Marchi et al. 2001: 162; Gravagno and Messina 2008: 19). The impressionistic decision-maker lets the substantial rationality of the action prevail over the format rationality of bureaucratic decisions. The impressionistic decisions are sensitive to the local values and to the organizational culture of the place; they give room to relationships underpinning risk landscapes.

To summarise, I argue that in subaltern communities living in contaminated contexts in which forms of power, corporate and state control have been exercised over the years by using also a toxic narrative (Houston 2013; Barca 2014), the SSS allows mapping the multi-nuance array of community responses, unearthing the other alternative stories of territories and building the basis for creating a more democratic way to build knowledge and to governance risk landscapes. To do so, a technocratic approach to the planning of risk landscapes is not enough, rather the SSS approach is more apt. Needless to say, that this is something impossible to do by using the mere quantitative and techno-driven approach to research based on BD.

In the following chapters, I aim to show how a planning approach focusing almost exclusively on a quantitative and technocratic analysis of risk can uncover neither the socio-economic and environmental transformations of risk landscapes, nor the community's responses to risk. I will prove that this inadequacy is even more apparent in “slow disasters” such as ones due to industrial contamination, in which harms are products of long and gradual processes of environmental degradation and entwined failures of nested sociocultural, political, and technological issues (Gray-Cosgrove et al. 2015; Knowles 2014; 2018). These "slower-burning issues" are

more difficult to measure with conventional methods of science or big data (Mah 2017: 130) since they are environmental hazards occurring on slower time scales. Building upon Alice Mah's proposal "to slow our approach to big data" (ibidem).

However, the point here is not to get into the discrepancy between lay and expert knowledge, but to prove how the planning tools put in practice in risk areas are not apt to intercept the array of community's reactions. Even if the SSS approach to the risk landscapes is fed by the collection of toxic autobiographies and small data, I also believe that "big data and small data are dance partners" (Lindstrom 2016: 202) i.e. they are complementary to each other.

Furthermore, the collection of toxic autobiographies and small data are needed in order to experiment the citizen science, to re-signify the concept of risk and to implement its management and mitigation, to co-construct a collective history of risk landscapes, to investigate indigenous and local knowledge. The SSS approach may represent the prelude of an action-research path in a context in which the risk is high but the public involvement and organization seem fragmented and powerless (Privitera 2021b).

By unearthing the relationships between human and non-human bodies with contamination (stench, pollution, waste, diffuse illnesses, and devastated landscapes), I argue that the SSS approach, through small data and toxic autobiographies, is appropriate for a contaminated area with high and slow environmental risk at least for three reasons: (1) they intercept the socio-economical-environmental connections underlying risk landscapes and their slow and diffuse transformations over time and space; (2) they lead to uncovering the power imbalance and the injustice shaping the landscapes, including humans and more-than-human; (3) they are consistent with the epistemological current seeking to create an extended peer community that uses "extended facts" (Funtowicz and Ravetz 1992).

2.3 The methodology used in Gela

In this section I will present the methodology applied in Gela so as to present the practical translation of what I have grounded in theory in the previous chapter. I will describe both the methodological tools and the diverse sources I referred to. Finally, I will explain how the ethical concerns have affected my self-critical position during and after the fieldwork.

This research is rooted into the practices of the case-study approach, which is “an empirical inquiry that investigates a contemporary case in depth and within its real-world context” (Yin 2014: 16). As explained by Bent Flyvbjerg (2006: 228) “the case study may be central to scientific development via generalization as a supplement and alternative to other methods”. As a consequence, the choice of the critical and paradigmatic case (Kuhn 1987) of a contaminated town allows me to discuss the relevance of small data in the construction of knowledge and in the planning of places affected by slow burning issues and slow violence. In order to access, interpret and achieve the verification/validation of small data potentialities, I have mobilized specific methodological tools including hermeneutic interviews, walking interviews, active listening, and toxic autobiographies.

In this sense, this research is the fruit of the disciplinary osmosis under which I integrated heterogeneous knowledge, tools, and sources. In practical terms, the disciplinary osmosis has meant that during my research in Gela, I never strictly separated qualitative and quantitative sources of knowledge but rather, blended them, sparking a positive cycle of experience, reflections on the collected data, fieldwork, and reframing of theoretical questions.

There are different types of data and sources.

The first group of information mainly consists of numerical and quantitative data obtained from documents such as public health dossiers, official epidemiological accounts, scientific articles, and environmental reports. These data are often the products of statistical formulas and mathematical models, which have turned out to be useful in providing a general overview on some issues, but also in confirming or sometimes contradicting small data. When a similar mismatch between BD and small occurs, then most likely an arduous but challenging point for additional research arises. The main sources of these groups of data are ISTAT⁶⁷, for economic and demographic data, ISPRA and ARPA for environmental data regarding toxic substances and pollution, CNR-IFC, National Research Council Institute of Clinical Physiology, especially for

⁶⁷ ISTAT is the Italian National Institute of Statistics. ISTAT is the main producer of official statistics in Italy. Its activities include the census of population, economic censuses and a number of social, economic and environmental surveys and analyses.

epidemiological reports. To this first group belongs also other scientific committees and working groups, as well as academic research teams and freelance researchers who have produced knowledge about Gela in terms of Master and Ph.D. thesis, mostly coming from Sicilian universities, international and national peer-reviewed articles, proceedings, reports and other forms of “gray literature”. Interestingly, a few quantitative sources come from environmentalist dossiers and from the Rete 2000 Natura plan (see chapter 3.1). If the more institutional sources of information can be easily found on the internet into formal documents and are both in English and in the Italian language, most of the time I discovered the gray literature and all those less institutional quantitative dossiers and documents, that, by the way, are mainly in Italian language, by word of mouth and direct contact with some residents and activist.

The second group of data is made of those publications regarding Gela and coming from the social and humanities field. Among them, it is worth mentioning the monograph “Industrializzazione senza sviluppo. Gela: una storia meridionale” (Industrialization without development. Gela: a story from the South) by Hytten and Marchione (1970) that is a cornerstone of the bibliographic history of Gela and, more in general, an acute critique of the imposed industrialization. More recent work is the sociological analysis “Spazi e società a rischio” (Spaces and Society at risk) by Pietro Saitta (2009) depicting the social and environmental degradation of Gela. It is specifically about Gela also another book, “Per una Speranza affamata” (For a starving hope) by Alessandro De Filippo (2016), that through the quite innovative and unusual lens of the industrial company cinematography traces back the story of Gela. These three pieces of literature have a more academic style also because they are written by university professors and/or researchers. Other semi-academic books, having a relatively lower circulation than the former, are “Inquinamento e territorio. Il caso Gela” (Environment and Territory. The case of Gela) edited by Giuseppe Amata, “La città sospesa” (The suspended city) edited by Stefano Becucci (2004) and “Fuga dall’illegalità” (Escape from Illegality) by Elena Ciccarello and Marco Nebiolo (2006). They mostly scrutinize the topic of contamination, the first in relation to the reasons for environmental degradation and the methods to evaluate and possibly reduce it, the following two treats not only the contamination due to toxic matters but also the contamination due to toxic and corruption mechanisms spurred by the mafia and organized criminality into the decision-making processes and the transformations of the city. An even less publicized monograph is “Giornalismo e Ambiente” (Journalism and Environment) by Alessandra Emanuela Cascino (2009) that, almost impossible to find in any libraries and bookshops, retraces back some part of the recent conflicts of work Vs health in Gela through the interpretation of the newspapers' publication over a period of three months during one of the most dramatic moment of the history of Gela due to the closure of the plant in 2002. A peculiar text that, in my opinion, deserves attention is the one published by Andrea Turco (2018) and titled “La Città a Sei Zampe” (The city with six paws). Mostly conceived for a general-interest public, this book is both the passionate autobiography of a local resident and activist of Gela and the detailed investigative narrative by a journalist, since the author, a local journalist, embeds this double role. In addition to the so-far mentioned books, mostly procurable in bookshops, libraries or online, the literature review about Gela is quite varied and includes extended publications on the ancient Greek origins,

ruins, and numismatics. Furthermore, there is a smaller and more local literature regarding Gela and published by minor publishing houses or sometimes even self-produced. These publications are almost impossible to find in bookshops, libraries, and online, on the contrary, they are accessible only in the public library of Gela or, in a few cases, they are obtainable only by directly contacting the authors or by word of mouth. Also in this case it is evident that direct interaction and immersion in the fieldwork is a needed requisite to get to know about the existence and then to access these gray literature and unusual sources. Some of these minor publications regard the folklorist traditions, including religious and pagan ones. An even more reduced amount of such minor literature, which is residual in relation to all the rest that has been written on Gela, regards the peasant struggles for the land between the 1930s and the 1960s with agrarian reform. Mostly written in a not always formal way by local communist spokesperson Paolo La Rosa, these books, accessible at the municipal local library, are a cross-section of the rural life and struggles at that time. However, a few texts of this gray literature have been quite influential during my research since they have provided an embedded, often naive, genuine and sincere perspective on the past and present events in Gela as well as on the disappointments, perceptions, and hopes of the citizens of Gela. Among these texts, the self-produced book of Danilo Esposito Paternò (2012) “Grande storia di un piccolo uomo. Le verità non dette sul clorosoda-dicloroetano di Gela” (Great Story of a Little Man. The Unspoken Truths about Gela's Chlorosoda-dichloroethane) is a book of denouncement that was written in one go and with his gut by the son of one of the many ex-workers of the chlorosoda-dichloroethane sector of the plant who have lost their lives due to cancer. It provides a cross-section from the inside of the frustration and suffering from all those people struggling simultaneously against deadly diseases and to prove the causes and the accountable subjects of such illnesses. Another local publication is “Angeli gialli” (Yellow Angels) that, edited by the local writer Maria Grazia Fasciana (2013) and financed by the Palermo Volunteer Service Center, is dedicated to the organization ADOS. Distributed in exchange for a free donation directly inside the oncology department of the hospital of Gela, this book is a unique collection one of the life stories, poems and photos of women who have faced breast cancer, many of which gave birth to the organization, unearth the daily difficulties of this illness of stories and autobiographies of women from Gela who have survived or are still fighting a tumor. Its title refers to the yellow coat that volunteers who help breast cancer patients in the hospital of Gela used to wear to be recognizable. Despite avoiding any direct position or attack or even reference to the fear that contamination is the real cause of so frequent health issues, this theme is latent throughout the entire publication. The solidarity is the weapon to react to the feeling of socio-ecological and health injustice also in the book written by Giacomo Giurato (2021) “Io voglio vivere” (I Want to Live). By being himself afflicted with a very rare cancer, Giacomo’s response is helping other patients and people in need. Finally, other extremely scarce books are the ones published by Rosario Crocetta (2006, 2013), ex-mayor of Gela, champion of the anti-mafia, who fell into disgrace when it was found to be himself the first involved in mafia business.

The third group of sources consists of a quite rich family of movies, short-movies and video-documentaries regarding Gela and its industrial development. Despite being quite varied, these cinematographic sources have

some common threads. They have been produced in a time frame between the end of 1950s and the 1970s and distributed both in the cinema and in the national television having as a specific target the Italian public and. Most of them have been commissioned directly by ENI or by the State through the national Istituto Luce to quite famous documentary directors as a part of a general propaganda strategy (that some authors would define as “toxic narrative”). This happened because at that time, ENI was still a state oil company that wanted to establish itself into the global market of oil, gas, and energy producers in competition with the so-called “seven sisters”, i.e. seven transnational oil companies of the "Consortium for Iran" oligopoly which has been dominating the global petroleum industry for several decades. Obstinate wanted by the businessman Enrico Mattei, head of the Italian state oil company ENI, the ENI department of communication had precisely the goal to emphasize the incredible effort by ENI (and therefore by the State) to reduce the gap North-South by bringing wellbeing, development and emancipation to poor areas of the country through the industrialization. How I will unpack further in Chapter 3.3, it is for these reasons that most of the movies (around twenty in total) adopt a triumphalist rhetoric based on a bivalent account depicting the advancements coming from industry in contrast with the retarded rural territories. Some of these movies are available on YouTube or more specific on the YouTube channel of Istituto Luce⁶⁸, some others in the historic archive of ENI. I could access some of them also through the Special office for cinema and audiovisuals of the Sicilian Region having its headquarters in Palermo.

The fourth group of sources comes from the press review of both national, regional, and local newspapers and the monthly company magazine “Il Gatto Selvatico” (The wildcat) accessible online. I have gone through only a few national newspapers such as “La Repubblica”, while I have given more attention to the regional and local ones. To the first group belong “La Sicilia”, whose recent articles are available online, “Il Giornale di Sicilia”, il “Quotidiano di Sicilia”, whose old articles are accessible in the Main Regional Library in Palermo or, in few recent cases, online, and “MeridioNews” that is a young newspaper this is why its articles are recent and easily searchable online. It is worth pointing out that I have not done a profound and scientifically correct press review, complete of discourse analysis, instead I have used some old articles published between the 1950s and the 1960s for confirming and/or amplifying and/or confuting other data coming from other sources. I have also used some more recent articles in order to follow the last news about the green-refinery conversion process and the updates on the ongoing trial of environmental disaster, on which there are not many recent literature references.

The fifth group of information comes from an intensive fieldwork in Gela from October 2018 to January 2019, then, from September to October 2020 when for a month I completely moved to Gela, and again from April to May 2021. Needless to say, the covid pandemic has dramatically impacted the entire fieldwork, and even more the way to make interviews and interact with people. More in detail, my fieldwork, initially programmed for

⁶⁸ The Istituto Luce was an Italian film corporation, created in 1924 during the Fascist era. The Institute, based in Rome, was involved in the production and distribution of films and documentaries intended for being screened in cinemas.

lasting three continuous months between March and May 2020, was suddenly interrupted. I could move back to Gela only in September 2020 and under very strict rules and constraints by my university. In addition to the formal and bureaucratic restrictions due to the pandemic, normal interactions changed entirely. For instance, people, above all at the beginning, maintained a more suspicious attitude, became further from one another (physically), preferred to meet outside instead of inside in less crowded places, and often wore masks.

I have done 52 interviews, of which: n° 40 in depth interviews (30 with self-organized civil society; 4 with trade unions; 1 with private entrepreneurs; 1 with a city councilor; 1 with an ex-mayor; 1 with an employee of the refinery; n°2 architects involved into the elaboration of Gela town plan); n°4 "focus groups", n°1 toxic tour, n°7 "Walking interviews" (Evans and Jones 2011) [Table 2]. With many of the interviewees I have met with or talked to on the phone more than once, in a few cases an actual relationship of mutual trust and friendship was born. The interviews have occurred most of the time in daily life places for the interviewees, such as their own home, bars, public spaces of Gela. After obtaining their consent, I recorded them and took notes. In some cases, the structured interview took place after several meetings with the same person. In some cases, I interviewed the same person several times on separate days, sometimes with a distance of months or years. In addition to these interviews, I had several informal conversations. With toxic tours I refer to expeditions to polluted places often led by members of communities that had been historically disadvantaged and bore an undue burden of industrial pollution (Pezzullo 2009). Toxic tours emerged in the environmental justice movement in the mid-1980s, as activists in North America began to articulate the ways in which race, class, and environmental assault were tightly linked. The movement theorized how certain spaces came to be seen as 'appropriately polluted' (Higgins 1994) or as 'human sacrifice zones' (Bullard and Benjamin 1999). The idea of a 'toxic tour' is inviting outsiders into spaces they would not normally go, in order to bridge spatial, political, racial, and affective distance by presenting a first-hand demonstration of places where the 'other' lived, worked and played. The walking interviews, as I have partly already explained (see chapt. 2), are carried out with activists and locals who confirm how mobile interviews engender more place-specific than sedentary interviews and produce "a decidedly spatial and locational discourse of place, which is structured geographically rather than historically" (Evans and Jones 2011: 856). In addition to this, I conducted 10 inspections by myself, I participated in an n° 1 event concerning urban regeneration through art, and I participated in 2 public events concerning the theme of the environment. In one of them I was involved in first-person to present my ongoing research and, on this occasion, I received some feedback that have partly modified some of the directions of my work. I have also taken part in a day of protests against further offshore drilling close to Gela and neighboring villages. The involvement in the day of protest, besides being an occasion to scrutinize who participates in the event and how, has implied the initial engagement with some activists, in order to also create mutual trust. During all the fieldwork, participant observation has provided insights into the daily relationships between people and their living environment

I have selected the informants via the so-called "snowball effect," starting from some key actors in the community. The toxic autobiographies have followed the structure of the so-called hermeneutic interviews

(Walker 2011) and "lived experience" (Mugerauer 1994; Malpas 1999), emphasizing the subjective dimension and generating an exchange between the researcher and those interviewed through "active listening techniques" (Sclavi 2003; 2007: 293). Thanks to militant street engagement with locals, I learned about an existing grey and self-produced literature regarding subaltern voices that, as I said, I included in my sources.

Consistently with the case-study approach and "its ability to deal with a full variety of evidence –documents, artifacts, interviews, and observations" (Yin 2014), which are the product of diverse data collection methods (Eisenhardt 1989), we never separated qualitative and quantitative sources of knowledge, rather we blended them, sparking a positive cycle of experience, reflections on the collected data, fieldwork, and reframing of theoretical questions.

In such a sensitive environment, I have seriously considered the ethical issues arising from my research. Obviously, I have carried out the interviews only after I obtained an informed consensus, that is, after I explained to the interviewees the mission of the research and after they signed an ethical permission document, being aware that at any moment they can interrupt the interviews or withdraw from the project. On a deeper level, I have applied a self-reflexive approach to my work as researchers, a choice which has implied to critically examining power relations and positionalities in the research process, and my accountability in data collection and interpretation (Sultana 2007a; Jones et al. 1997; Moss 2002). As Farhana Sultana has argued, self-reflexivity can also be a "political act [that] means a conviction to making a difference in the lives of those involved in the research process rather than simply producing academic outcomes." (Sultana 2007b: 3). Developing a non-exploitative research practice has been a crucial point in my self-reflexivity and research ethics; this implies to avoid the usual extractivist mode of research production (enter in the community, extract data, go away) while fostering other modes of knowledge production based on care, commoning, and long-lasting commitment. The research will be restituted to the community through non-academic outputs, while I am aiming to blur the divide between the author and the object of the writing, producing for Gela a similar collective autobiographical volume Marco Armiero (2014) has produced with nine female activists for another highly contaminated area in Italy. Building upon Audrey Kobayashi's reflection on self-reflexivity (2003), I believe that acknowledging privilege and positionality is not fostering per se a progressive agenda; rather, in this case, self-reflexivity is the result of an intellectual and political project committed to social and environmental justice.

In line with this inclination, several previous experiences show my commitment together with activists and with community-led processes. For instance, I have carried out long-term partnerships with grassroots groups and civic organizations, in some cases producing together permanent expositions (Barbanti and Privitera 2018) or carrying out action-research paths, as the following publications show (Barbanti et al. 2021; Privitera 2021c). Finally, beyond producing scientific articles and the present Ph.D. dissertation, I will edit a popular science book for sparking public debates.

3. ALL LANDSCAPES OF GELA

3.1. An Account of Gela's Urban Planning Tools and History

This section regards an account of the risk landscapes of Gela according to the perspective of planning history and tools that have been elaborated and enforced over time. First, I will present an account of the physical characteristics of both the urban and rural landscapes of Gela. Then, I will unfold how the two Piano Regolatore Generale (PRG)⁶⁹ -that are the main land-use-plans/the general urban development plans of Gela- have constructed risk knowledge in order to drive the content of the plans. I will do the same analysis for a more recent and specific local plan about urban sustainable mobility. I will also examine two other planning tools: the regional landscape plan and the management plan for Rete 2000 sites. Finally, I will scrutinize the gaps and potential outcomes of the Remediation Plan of Gela that addresses areas that are at high risk of contamination.

A Descriptive Account of the Physical Landscapes of the Plain of Gela

The town of Gela is located along the southern coast of Sicily, overlooking the African continent. Perched on a hill, or rather, on a large prehistoric sedimented dune that stretches along the coast between the mouths of the Gela river, from which it takes its name, to the east, and the Gattano river to the west, the town of Gela on the southwest side overlooks a low and sandy coast towards the Mediterranean Sea, giving life to the largest gulf in Sicily. On the northeast side, Gela stands out on one of the largest plains of Sicily to which it gives its name, "Piana di Gela" (Plain of Gela). Gela has a total area of 27,337 ha and extends entirely over the Piana di Gela that goes from Licata to Vittoria, from Butera to Scoglitti. Formed by the Gela River and its tributaries Maroglio and Cimìa, the Plain of Gela is the largest alluvial plain in southern Sicily, the third largest plain in Sicily, and also constitutes the largest irrigation area thanks to the damming of the Disueri, which has allowed development of intensive agriculture. To the north, the plain is bounded by a hilly system that connects with the highest peaks made up of the Erei and Iblei Mountains, from which predominantly torrential watercourses descend, the most important of which are the aforementioned Gela and its tributary, the Maroglio, and the Gattano stream. These rivers are characterized by strong seasonal variations in flow and by long periods of drought in the summer season. It is worth noting that these water sources, albeit seasonal, take on even more importance given that the whole municipal area of Gela is characterized by more modest monthly and annual average rainfall values than those in the rest of Sicily, which already has of the lowest values of annual precipitation in all of Italy. In fact, the coastal region surrounding Gela has very low rainfall, with less than 500 mm annually.

⁶⁹ Piano Regolatore Generale (PRG) means "General Regulatory Plan" and it coincides with the town plan or local strategic plan enforced by the local government, in this case by the local government of Gela.

The plain is bordered to the west by Mount Zinglino, beyond which lies the Piano Marina, engraved by the Comunelli stream (which, flowing from north to south, constitutes the physical limit of the area of competence of the Municipality of Gela). Another significant geographical landmark is Monte della Guardia, located to the north, on which the Castelluccio, an ancient defensive bulwark of the Piana, is located. To the east, the plain has no physical limit. On the contrary, it continues with a gentle hilly system, with large flat areas. This is the most valuable naturalistic area, it is here that the Piana del Signore and the Biviere Reserve are located, both important for the migration of many fauna species, and the coastal dunes (locally referred to as 'Macconi')⁷⁰, coastal dunes covered with typically Mediterranean vegetation. These mainly sandy and not very pronounced edges extend for about 25 km, although nowadays are compromised by intensive agriculture and coastal erosion. The instability of the substrate, the lack of nutritional elements, the aridity and the excessive drainage of the soil together with the action of the waves and the wind make the Macconi environments. Only certain species are able to live and overcome these extreme conditions. The seabed is generally shallow and the entire coastline overlooking the gulf is devoid of natural harbors. The residual areas of this ecosystem, marked by halophilic and psammophilous vegetation, that is typical of soils rich in salt and sandy coasts, are located west of Gela, after Montelungo and Manfria. From an aesthetic point of view, the peculiar characteristic of this coast is that it is wide, long and golden. It is no coincidence that the winner of the Nobel Prize for Literature in 1959, Salvatore Quasimodo, has dedicated the following poem to Gela:

“Su la sabbia di Gela colore della paglia

mi stendevo fanciullo in riva al mare antico di

Grecia con molti sogni nei pugni stretti nel petto”

[tr. *On the straw-colored sand of Gela I stretched out as a child by the sea,*

ancient of Greece with many dreams, in his fists, clenched in his chest.

There Aeschylus in exile measured verses and disconsolate footsteps,

In that burnt gulf the eagle saw him and it was the last day]

While along the coast the nature of the soil is predominantly sandy and clayey and the morphology has slightly sloping slopes, in the part of the plain adjacent to the Gela and Maroglio rivers the soils are alluvial or allochthonous, deriving from sedimentation of detrital materials of a predominantly silico-clayey nature. In Manfria, Guardia and Monte Olivo there are clayey-limestone soils, while chalky limestones are found in Castelluccio and on the slopes of Monte Olivo.

⁷⁰ Macconi is a dialect expression to refer to the dunal system.

From a naturalistic point of view, the landscapes of Gela are varied, with diversified and complex ecosystems, but they are almost always the residues of larger, intact and wild environments. The territory has a diversity of environments depending on the altitude, and consequently the climatic conditions, the characteristics of the soil, and in particular the anthropic influence. The agricultural vegetation consists partly of herbaceous species scattered throughout the territory, and partly of woody crops (vineyards, olive groves, almond orchards, citrus groves, etc.) concentrated mainly in the eastern part of the territory. The uncultivated area occupies about 12% of the total. These areas are mostly located in the marginal areas, in particular at the highest altitudes (150-300 m.l.m.), or relegated to areas with slopes that usually exceed about 30%. The wooded and spontaneous vegetation present in the territory is classified in woods, scrubs and, in most of the degradation stages, included under the term scrub and various xerophilous and heliophilous herbaceous formations; in the stretches falling into the torrential impluvium, the presence of plant populations of the iglophilous type is highlighted. The presence of forest-type tree species is rather limited in relation to the entire municipal area. At slightly higher altitudes, precisely in the northeastern part of the territory, we find the quercionilicis association, mainly represented by evergreen holm oak and cork oak forests. The cork forest of San Pietro, strongly rooted in the common feeling of the inhabitants of Niscemi, is instead less perceived as an integral part of the landscape by the citizens of Gela. The plant species typical of the oak undergrowth has been replaced by a flora with more marked xerophilic characteristics, that is capable of living in arid and sunny soils. Finally, the "Mediterranean dwarf palm" (*Chamaerops*) is present throughout the coastal area and in some cases in the hinterland.

This complex network of ecosystems is regulated and protected by the Community Directive 92/43 / EEC, of the Council of the European Communities, of 21 May 1992, implemented with Presidential Decree of 8 September 1997, n.357 by the Italian State, relating to the conservation of natural habitats and semi-natural and wild flora and fauna. The legislation defines in its entirety the actions to be taken for the protection of the aforementioned areas considered important and strategic for the biological balance of animal species. The establishment of a coherent European ecological network of special conservation areas, called Natura 2000, also derives from the Community directive. This network, made up of the sites where the natural habitats and the habitats of the species are found, must guarantee the maintenance and, if necessary, the restoration of these ecosystems. In the territory of Gela, two large areas of Site of Community Importance (SCI) [Figure 4] have been established:

1. Il Biviere and Macconi Gela (ITA 050001 within the Natura 2000 network). It is area of about 3,600 ha and located east of the town of Gela, close to the petrochemical plant, up to the border with the territory of Vittoria. This site has been identified as both S.I.C. that like Z.P.S;
2. Torre Manfredia (ITA 050011 within the Natura 2000 network). It is an area of about 700 ha and located west of the city of Gela in Torre Manfredia and includes the Montelungo hill. This site has been identified as S.I.C.

In both SICs, despite the strong anthropic disturbance (massive urbanization, reforestation, bathing activities, greenhouse cultivation, industrial settlements, etc.), very peculiar plant communities are still present, in which

rather significant species from a phytogeographical point of view are located (*Astragalus caprinus*, *Oncostema sicula*, *Leopoldia gussonei*, *Retama retam* subsp. *gussonei*, *Hormuzakia aggregata*, *Ophrys lunulata*).

In the light of what has been said, it is possible to understand why the Piana di Gela represents an important piece of the Natura 2000 network in Italy. It was, in fact, designated as Important Bird and Biodiversity area (IBA) in 2000 with a land area of 36,008 ha and a marine surface of 5,384 ha which includes a complex of wetlands, agricultural and coastal waters that form a rest area of great importance both for migratory water birds and for nesting species typical of the Mediterranean area. For the anatids it is a “bottleneck” or “leading line”, or an area located along the preferred direction of transit of the migrating species. The Piana di Gela forms the only corridor that crosses the Sicilian hinterland and favors the crossing of Sicily for the aquatic birds coming from North Africa, especially in the spring period, when more than 45,000 birds migrate to the area. The IBA area includes the Biviere di Gela and the adjacent stretch of coast, the agricultural areas to the east and north of Gela and the stretch of sea facing it. The urban area of Gela, the petrochemical complex with its port, and some areas of lesser environmental value to the north and west of the city, are excluded from the IBA.

The human activity has resulted in forest-agro-pastoral exploitation of the territory which has triggered erosion, hydrogeological instability, and soil depletion. These negative consequences have been further worsened by the senseless reforestation works with non-native essences, which have upset the original floristic landscape. To this must be added the presence of greenhouses, industrial plants and unauthorized buildings that have devastated the coastal strip. In these places the landscape references are no longer the hills and the sea that appeared on the horizon, but an uninterrupted wall of chimneys, houses, and greenhouse systems that reach the shoreline. Today the intact areas are found in few and limited areas where it is still possible to find the typical flora of the Mediterranean dunes and in the Biviere, one of the most important wetlands of southern Sicily. However, even in the vicinity of the Biviere, the strong anthropogenic pressure caused by the crops and greenhouses risk altering the characteristics of the dune belt and of the wetland itself, which are today protected by an oriented reserve.

An Account of the Urban Landscapes of Gela: Between the Risk of Illegality, Inequalities and Contamination

“The orographic system in which the city of Gela is located is essentially a basin that encloses the city, leaving a vast plain in the northernmost part, to which the Mediterranean Sea acts as a counterpoint to the south. Compared to this system, which we could assimilate to a natural amphitheater, the city occupies the central place, rising moreover on a hill which, together with the mountain system, offered in the past centuries an efficient defensive system” (Urbani et al., General Regulatory Plan 2010: 4)

The transformations of the landscapes of the entire Gela plain are inextricably linked to the industrial turning point and to the consequent urban development of the town. The orography, fertile soil, and the Mediterranean and airy climate of the Plain of Gela have made it attractive since the Neolithic Period when the first Gela was founded at the end of the 5th millennium BC. However, its main roots are in ancient Greece- of which it was one of the first Sicilian colonies. The real polis was founded in 688 BC by Greek colonists from Rhodes and Crete and led respectively by Antifemo and Entimo, who also built the first protective wall system (at the time, Gela was called Lindos). The Doric city, whose vestiges are still visible in what remains of the acropolis, was destroyed in the last decade of the fifth century. by the Carthaginians, and then refounded again by the Corinthian leader Timoleonte, from whom the remains of the mighty raw earth walls called “timoleontee” take their name. It was in this period that it was called Gela, from the indigenous name of the river Gela⁷¹ and which probably means "swirling" or “icy” and its inhabitants were called “geloï”.

Disappeared and forgotten in the Middle Ages, the city was reborn in 1233 A.C. by the will of Federico II di Svevia who gave it the name of “Heraclea Terranova” [Figures 5 and 6], which later, with the unification of Italy, became Terranova di Sicilia, and finally renamed Gela from the Fascist period onwards.

Over the centuries, the community of Gela, on the one hand, has been hetero-directed by external subjects who have decided its political destiny while, on the other, it has almost always maintained a socio-economic structure mainly based on herding, fishing, craftsmanship, and farming and linked to both the sea and the fertile fields in the plain. From these natural characteristics derived the intense traditional production of sponges, clays and wheat, the latter substituted by cotton during the fascist period⁷². This socio-economic system was taking place in quite poor and degraded urban fabrics located on the hilly corrugation, parallel to the coastline and having a fairly compact and homogeneous orthogonal urban-grid-structure. Built on the ridge that closes the plain of Gela dividing it from the sea, the historic town had developed around the Federician nucleus, maintaining an extremely centralized settlement typology. The morphological and environmental characteristics of the places contributed to this, such as the famous nature of the terrain on the southern side or the unhealthy conditions of the plain to the north. The expansion had been limited by the desire to live near the center of community life which was the square and the main street. All these factors have contributed to the creation of increasingly populous and overcrowded neighborhoods close to the historic center, or toward the plain in which the poor and dispossessed classes were gathering: small landowners, farm laborers, and

⁷¹ In Greek times the river Gela was considered a divinity and played a fundamental role in the life of the great polis gela. Today with industrial waste, the ugly surrounding landscape and the neglect of the surrounding land, it is offended by its great history and the role it played in past centuries.

⁷² The fascist regime (1922-1943) has tried to re-organize the entire socio-economic structure of Italy according to autarchical and self-sufficient principles. In order to do so, the fascist regime has pushed the cultivation of products, such as cotton, that usually were imported from other countries. As a result, many crops were changed with different ones. The shift from wheat to cotton in the plain of Gela is an emblematic example of this trend during the fascist period in Italy.

permanent unemployed. As Eyvind Hytten and Marco Marchioni (1970: 12) encounter during their period of stay in Gela “the roads are, for the most part, cobbled or unpaved; the houses (...) almost totally lack sanitary facilities; very often it is a single room, artificially divided into various spaces intended for various uses. Often even the beasts (the donkey or the mule) and the farm wagons are necessarily housed inside the house. The overcrowding is enormous. Typhus appears as an endemic manifestation, despite the limited number of reported cases. It is clear that overcrowding, the lack of water and services are the most immediate cause”. The small and medium-sized bourgeoisie, once they had exhausted the possibility of establishing their own residence near the center, had begun to look for new living spaces and green areas overlooking the sea, especially in the Capo Soprano hill (Hytten and Marchioni 1970: 12). In addition to this, it is worth considering that in the 1950s, Gela’s socio-economic characteristics and employment organization were similar to the ones of other marginal Southern areas. The primary sector undergoes major transformations- such as the rapid and definite abandonment of the widespread cultivation of cotton, the fragmentation of land linked to the implementation of the agrarian reform, and the scarcity of capital invested in agricultural production. From these years onward, the employment structure tends to assume specific characteristics due to a greater decline in agricultural workers, offset by the higher incidence of the construction sector which becomes the main sector of activity. The strong expulsion of employment from the agricultural sector tends to be absorbed by the construction of a rural village for 300 families, the Town Hall, and some infrastructure works in the municipal area. Thus, began in those years a process of constitution within the labor market of the figure of the "day laborer-construction worker"⁷³, in other words an increasingly large share of the marginal proletariat is tied in a precarious way to the fate of construction. Construction work becomes increasingly precarious and insecure due to dependence on external decisions, which cannot be controlled in any way at the local level. The size and the occasional nature of the interventions activated on public initiative, together with the high supply of workforce, facilitates and makes the entry of external companies in the Gelese context attractive and this, at the same time, hinders the establishment of an entrepreneurial business. The only form of relationship between these companies and the construction workers of Gela is reduced to the appearance of improvised mediators with the local labor market. Given these premises, the intervention of external companies seems obvious, especially for the construction work of the ANIC plant and residential village. The employment construction sector reaches its maximum expansion during the construction work of the ANIC⁷⁴ petrochemical plant: an event that represents a turning point for the history of Gela, including the urban planning history. Due to the new (and perceived) job opportunities coming from the industrialization process, Gela experienced a sudden economic boom and attracted many people from the surrounding countryside, from Sicily, and continental Italy. Within thirty years, the population has almost doubled, from 43,678 people in 1951–74,806 in 1981

⁷³ A labor type based on day-by-day demand keeps the precarious status of workers and weakens their ability to organize politically.

⁷⁴ At the beginning the petrochemical plant of Gela belonged to ANIC (which was one of the companies acquired by ENI).

(ISTAT 2011b). I wrote “perceived” because even though during the ‘60s the construction of the plant has generated maximal levels of employment reaching 7000 workers between 1961-1962 (Hyttén and Marchione 1970: 137), however, this rate reduced dramatically when the construction was completed. While the dream of finding a job position in the plant will nurture the hope of many citizens for many years⁷⁵, in reality, job opportunities are drastically reduced for large portions of the population of Gela, excluded from the guarantee of stable employment in the plant or in the few “hooked” companies through contracts of various forms.

Between the ‘50s and the ‘60s, while on one side the local government was not able to provide urban policies and strategies to handle such a sudden and massive increase of population and housing demand, on the other hand, it can be recognized two different urban dynamics: the first attributable to more or less spontaneous transformations that affect the entire urban fabric; the second concerns the planned construction interventions of the Aldisio Village or the Macchitella village built by ANIC, destined for a long time to remain foreign bodies to the urban system. Regarding the first type of transformation, this is linked to the strong increase in the population, which contributes to making the already critical housing conditions more serious.

In the absence both, on the one hand, of a public strategy for the realization of economic and social housing, and, on the other, of a private construction sector organized and oriented towards a rational systematization of the housing market, Gela develops according to production practices, redevelopment and transformation of pulverized, widespread, and informal buildings. Illegal construction quickly emerges in the more peripheral areas, especially those considered less healthy and attractive towards the plain, but also affects the historic center. These new buildings are characterized by the use of poor materials, very simple building types, and backward construction techniques. This is further favored by the way they are built, not just illegal, but through forms of self-construction that draw on the non-technically professional workforce. The local authority is unable to play a decisive decision making and planning role. The only thing it does is ratify illegal urban transformations taking place through the issue of “building permits”. Most of the time the local authority does it in derogation from the requirements of the building regulations adopted in 1954 as an instrument transitional that only the PRG approved in 1970 will replace. Gambuzza (1986) defines the illegal urbanization phenomena in Gela as “unauthorized administration development” due to public inefficiency and lack of regulation of the urbanization process. While the less affluent social classes, coming from the underclass, transform the economic surplus of the few work activities into the wild construction of entire neighborhoods without urban quality and services, the urban trend of the bourgeois social classes and / or the working and managerial classes of the ANIC is different. The clear break between the forms of urban growth driven by private and subordinate

⁷⁵ Although terms such as “post-industrialism” or “de-industrialization” are widely applied in the literature, in line with what other scholars have argued, I do not believe these terms are suitable for photographing the complexity of an area, such as that of Gela. Various entrepreneurial and productive realities are still active in Gela, often linked to fuel oil and various derivatives of oil, but also, and above all, “images and imaginaries of multiple, different, possible, superimposable and non-overlapping futures of economic development” (Benadusi and Ruggiero 2021: 18).

subjects and the few interventions led by the public is also reflected in physical-spatial and typological terms and is clearly visible both in the Aldisio⁷⁶ village and in that of Macchitella created by ANIC: both are not only clearly separated from the inhabited center from a spatial-geographical point of view but made up of types and settlement models that are extremely different from those dominating in the context. In particular, the story of the Macchitella Village is an emblematic case, to say the least, of the social injustices perpetrated and accentuated by the industrial settlement. Built by ANIC in the early 1960s as a residential village specifically intended for factory workers, the village is located on a flat area close to the sea, separated from the historic core of Gela and on the opposite side from where the petrochemical plant is located. The "village" is built with a wide range of services and overall is characterized by a good environmental and housing quality, in stark contrast to environmental degradation and unhealthy conditions found in the rest of Gela. The physical distance of the neighborhood from the town affirms its image of a well-being and privileged place in which the rest of the city of Gela was not allowed to participate. In fact, until the '90s, the access to Villaggio Macchitella was permitted only to the residents of the village. The selectivity was guaranteed by the presence of a bar at the entrance, consistently with the praxis of the gated communities. Its architectural styles and urban layout reveal the exogenous and "colonial" character of the intervention (Turco 2018: 95), which make it a "modern" oasis and island, and at the same time an operative ghetto detached from the rest of local society (Hyttén and Marchioni 1970: 28). This village, instead of being the flywheel of a more equitable spatial distribution of modernity, has instead sharpened the social gaps already present. First of all, the location choice of the residential village of Macchitella, west of Gela (towards Licata) makes it clear that the company management has favored the location as far away as possible from the petrochemical, both physically and visually, leaving the areas closest and therefore unhealthy to all those who could not have the privilege of living inside the village. In addition, rather than preferring a dialogue with the municipal administration to agree in which areas to settle the village, ANIC has started direct negotiations with the most influential landowners. By making the village in this way, instead of becoming an opportunity for the involvement of the public and citizens, it has become a factor of further exclusion of them. Therefore, in this sense, both the decision and design process and the architectural characteristics of the village ended up accentuating the perception that there were more privileged social groups than others, highlighting the exogenous character of the intervention and the difficulty of the insertion, both in physical and social terms, of the reality of the factory in the context. Finally, the local authority, even in this case, therefore played a clearly secondary role in that in relation to the interventions of the ANIC it was unable to express any contractual force.

⁷⁶ Aldisio Village takes the name from Salvatore Aldisio who was an Italian Christian Democratic politician born in Gela. Thanks to the organizing work of Aldisio his hometown underwent a renewal process and also a social and economic transformation from the post-war years to the beginning of the 1950s. He initiated important public works, such as the Town Hall, the sea-haven, St. James' Church, Aldisio Village, the aqueduct, the civil hospital, the seafront promenade, etc. Together with Enrico Mattei, Salvatore Aldisio is almost a legendary character in the collective narration of Gela.

From the 1970s onwards, the dynamics of abusive development have increased further. Overall, the level of living and income has definitely risen and this has been reflected, in a contradictory and non-homogeneous way, on the level of consumption and in the characteristics of needs and housing models. For the weaker and poorer social strata, greater economic availability has led, in the absence of an offer of public housing or adequate production for the housing market, practices of abusive production that reached the dimensions of a phenomenon in the space of a few years. The slight improvement in family income leads to a change in self-construction practices and, more concretely, in the qualitative characteristics of the manufactured products. A new demand emerged in the 1970s which, no longer solvent through fragmentary and precarious forms of construction, tends to meet the favors of some landowners and arouse the interests of a nascent - and almost improvised - local entrepreneurship. The city continues to grow along the slopes of the hill on which the historic center stands and, always in a chaotic and uncontrolled way, also in the plain north of the town where environmental and climatic conditions are critical and until then used as an agricultural area from the PRG, or excluded from any type of public planning. It is good to underline how the spatiality of urban growth and the different construction and sales markets incorporate social inequalities. While the middle-upper class is not interested in the historic center and is oriented towards the more prized areas of Caposoprano, the poorer one settles in areas with environmental and morphological characteristics to make them unappetizing, located on the slopes of the hill and extended towards the flat. The urban conglomerates, today called neighborhoods, such as S. Ippolito, Baracche⁷⁷, Carrubazza, and Margi⁷⁸, "popping up" along the plain in a self-built way, with poor building quality and in the total absence of primary urbanization structures [Figure 7]. Paradoxically, a speculative bubble is triggered whereby the plots of land, despite having little value in themselves, are sold at exorbitant prices. The considerable incidence of the cost of the areas and the average size of the lots (30-50 square meters) have contributed to their high use and lead to the construction of single-family houses developed vertically, often with only one room per floor. The very high volumetric concentration worsens the already precarious hygienic and housing conditions: it is in fact frequent that the apartments have a single view on the side of the road while the others, bordering the adjacent buildings, are windowless. It is no coincidence that the designers of the Gela master plan state that "illegal is the most typical and traditional form of building production in Gela" (Municipality of Gela and Urbani & Associati 1996: 18) and the labor market in the construction sector, especially if illegal, are described as "the only economic sector expression of the Gelese community" (Municipality of Gela and Urbani & Associati 1996: 18).

⁷⁷ "Baracche" is the name of a neighborhood in Gela. The translation of the word "baracche" is something like "shacks" or "hovels". This nickname is explanatory of the type of buildings that were common in this part of Gela.

⁷⁸ The neighborhood "Margi" takes its name from the Sicilian dialectal word "margi" meaning "mud". In fact, this area of plain of Gela, was infamous for its slime and mud soil. Because of that, in the past, people avoided living there. Since the '70s, the illegal urban development of Gela expanded until even Margi, giving birth to an urbanized area facing numerous hydrological risks.

I define "amoral real estate familisms" are all those forms of mobilization, solidarity and collaboration between family or friend groups which have played a central role in the processes of abusive construction in Gela. In addition to this consolidated "amoral real estate familism" from the '70s onwards, a denser informal organizational and speculative network involving promoters, businesses and the workforce emerged. Building contractors who were refused licenses became land speculators, who bought land at agricultural prices and resold it parceled out to future squatters. The extra-institutionalization of the growth of the city was based on the widespread belief that "whoever did not build illegally was considered a fool" (Ciccarello and Nebiolo 2006: 37) while the abusive building market persevered in presenting itself as completely separated from any form of relationship with the local government, and is openly in contrast with the prescriptions of the current PRG.

Unlike what happened along the plain, since the first interventions carried out in Caposoprano, the building presented profoundly different typological and qualitative characteristics; with multi-family buildings built by recently established construction companies and with an excellent supply of services to homes.

The urban history of Gela so far confirms how the growth of the city reflects the existing social differences, accentuates them, and produces new ones. The urban reflection of Gela's industrialization consisted of the creation of a gated community and exclusion from the rest of the community. The more bourgeois classes not included in this gated community have settled in an area overlooking the sea and near the historic center, the rest of the sub-proletarian mass, made up of laborers and precarious workers, illegally self-produced huge portions of Gela's population settling where the environmental quality was already poorer and closer to the plant, by further confirming how the risk landscapes embed socio-economic inequalities. Finally, it is worth noting that it is possible to read the interplay between environmental and social injustice in the way the town of Gela has developed. However, there is no trace of any awareness of this collision of inequalities nor any real attempts to include the insurgent knowledge and practices in the urban tools, and plans so-far enforced in Gela.

Analyzing Gela's Risk Landscapes Using Mainstream Urban Planning and Tools

It is in the context just aforementioned that the first urban plans take shape. In 1963 the Municipal Administration started drafting the Piano Regolatore Generale - PRG (Town Plan) and entrusted the task to a team of technicians from Palermo. However, it will be necessary to wait until 1971 for the Plan to be approved by the Regional Department for Economic Development. Those were the years in which numerous interests tended to consolidate around the use of the territory, hitherto not very widespread and not very organized. A first draft of the PRG, approved in 1965 by the City Council, is presented as typical of the plans of the 1960s, both in the discursive form and in the merits of the contents [Figures 8]. This is characterized by a basically exhaustive treatment of all aspects relating to the territory and the urban history of Gelese (hydrography,

climatic and geological characteristics, demographic and economic dynamics, etc.); with regard to the contents, the analysis leads to overestimated demographic projections and sizing of the settling population, and to a "strong" image of the future city which, re-proposing on an urban scale echoes of the debate and of the timid attempts at regional planning that were making their way in those years also in Sicily, the need for substantial infrastructural interventions is the central theme. In fact, the adaptation of the infrastructural network of territorial connection and the creation of greater ease in intra-urban mobility are identified as propulsion elements and cornerstones of the development of Gela, and are seen as indispensable, also and above all, starting from the needs and potential offered. from the establishment of the ANIC. The attempt of the PRG to equip the city with adequate infrastructures and a better "urban form" will materialize in the proposals of the Equipped Axis and the Management Center. The plan places emphasis on issues relating to the "design of the city" and re-proposes at the center of the plan's activity the need to "give shape" to the "great" and "promising" transformations initiated in the belief that "the need for coherent planning at the urban level, far from limiting itself to the regulation of housing only, it is implemented in the spatial configuration of all territorial and urban structures and infrastructures, not only adapting to the needs posed by the development underway, but automatically contributing to its determination" (Nicoletti 1977: 35). It proposes the move north of the railway station and the upgrading of the former military airport; entrusts the implementation of the PRG to the drafting of "Detailed Plans" or "Private Allotment Plans", trusting in the latter case in the validity of the prescriptions made for the single homogeneous areas. However, the privileged role given to large infrastructural interventions and to the "urban morphology" entails the substantial underestimation of the "housing question., this plan does not give attention, neither in the analysis phase nor on the operational level, both to the dramatic dimensions of social needs and housing demand (Nicoletti 1977: 71). Needless to say, this plan does not deal in any way with the environmental and risk issue and does not in any way raise the question of catching, speaking, and integrating the knowledge, practices and needs present in the Gelese community. The needs are treated only in terms of urban standards. This first PRG renounces to enforce strategies of containment of the urban development in the North area, it supports and ratified the spontaneous expansion processes that were already taking place in those years; completes the entire area in the west of the historic center with intensive construction; allocates all the areas around the ANIC Village to a single "piano edilizia economica popolare" (popular economic building plan)⁷⁹ district of about 30ha. In the meantime, the plan was approved in 1971 and adopted to the most recent Italian law⁸⁰ that provided for the functional zoning

⁷⁹ "Piano edilizia economica popolare" (popular economic building plan - PEEP), in Italy, is an urban planning tool that has been introduced by the law 18 April 1962, n. 167. It is an implementation plan inserted within the municipal general plan (PRG), and is used by the municipal administration to program, manage and plan all interventions concerning public housing. Thanks to the PEEPs many affordable houses have been built in Italy.

⁸⁰ Law No. 765 of 1967 (known as the Bridge Law) brings a series of extensive changes to the Italian town planning regulations, which are decisive for rationalizing the system of tools and controls, giving it the configuration still in force today. Examples of such tools are: zoning in areas of conservation and building expansion, the definition of urban

of the area with the calculation of the standards to be integrated. The more specific contents of the PRG. were delegated to the detailed plans that will deal with the perimeter of the areas for the recovery of the illegal building stock and will be approved during the 1980s. The comparative reading of the Detailed Plans, from the point of view of the forecasts relating to equipment and services, complies as a whole with the minimum per capita standard required by national legislation. The criterion applied to predict the distribution of public areas takes into account the number of settlers, divided by area. It should be noted that the principle governing this subdivision is exclusively of a quantitative type. Meanwhile, the building permits will be issued, often in contradiction with the provisions of the plan. In this historical phase of Gela, the population seems to have considerable self-organizational skills or to support themselves through family ties or when the already critical existential situation is further threatened. When a resource is subtracted or in any case decreases, conflict arises (Di Riso 2013). This is the case of what has gone down in history as the "revolt of the unauthorized house builders". In 1983, five thousand people, mostly inhabitants of the illegal development, attacked the town hall, threatened the mayor and forced him to withdraw the anti-illegal measures that he had just approved. The violent drift of this event was attributed to Mafia and para-mafia protesters who in those years were increasing their power through rackets. "Some inhabitants broke into the municipal offices and set fire to the archives of the building sector, burning the practices relating to illegal construction. Some took the mayor and dragged him into the square, they were hours of panic and terror. The employees shouted "here they kill us all" (Ciccarello and Nebiolo 2007: 34-35). In short, the only attempt from the city council to introduce a limitation to the spread of illegal settlement by introducing a penalty was immediately stopped by a revolt that has been described as example of the diffused absence of civic sense of responsibility and as example of "amoral familism" (Di Riso 2014; Pellizzoni 2009).

Another sensational case is cited by the lawyer Ventura "after the crisis with the squatters of 1983 I was summoned to Palermo by the regional government, the president was Santi Nicita. They made a government resolution that defined Gela as the only reality in the Sicilian territory, due to illegal activities, for the industrial plant (Gela still pays a billion and a half a day in excise duties and manufacturing taxes) and established a preferential lane for financing projects relating to the city. 'Anything you have as projects, bring it to us and we finance'. It turned out that there was not even a project in the Municipality, and we lost that opportunity" (Ciccarello and Nebiolo 2006: 40).

Between the 70s and the 80s, a greater articulation of forms of urban production and construction emerged. To the sub-markets of housing production linked to illegal activities and to the private residential one of Caposoprano, we must add that of cooperatives. The latter, instead of becoming an opportunity for a more social solution to housing problems, is most often carried out through the privileged relationship between political parties, middle-class housing demand groups and supply operators. The experience of cooperatives

planning standards, and the process of approval of urban plans. The Ponte Law can be considered the fruit of the legacy of modernist urban planning of the twentieth and twenty-first centuries.

constitutes a further confirmation of the difficulty of the Municipal Administration to give concrete answers to the needs and questions that are not very solvent widely present in the city (Urbani 1996a). At the same time, urbanization continues to occur according to a discontinuous and building boom trend. It involves not only a distorted use of the housing stock, highlighted by the increase in the number of people not employed, but also accentuates the already serious problems of the urban structure and quality. Curiously, in Gela, as well as in other illegal Italian suburbs, extreme care in the definition and furnishing of the interiors of illegal housing is contrasted by the total absence of attention for the external finish of the building and for the environmental quality of the entire area. almost 6,000,000 cubic meters of housing are built in a context in which the public water and sewage system is reduced if not in some cases even non-existent. The illegal urbanism, already described, is accompanied by a massive and uncontrolled construction in the coastal area, from Gela to Butera and Manfria, of second homes for seasonal tourist use, sometimes even having a luxurious appearance. The causes of this phenomenon can only be found in the strong pressure in housing demand for residential and tourist purposes and areas for commercial and productive purposes, and inadequacy of the existing urban planning tools, often outdated, expired or in the process of being renewed. It is no coincidence that the designers, commissioned at the end of the 1980s, to draw up a new PRG for Gela, they write "the city is not only characterized mainly by illegal construction, but looks like a huge and dusty construction site and the most immediate image that can be drawn from it is that of precariousness, of the unfinished, of premature decay" (Municipality of Gela and Urbani & Associati 1996: 26). From the 90s onwards, the expansion in the areas of the plain almost completely stopped. This contributes aggravating the ongoing employment crisis in the construction sector, to which is added a situation of serious crisis and social tension due to the bloody war between local mafia families of Gela for almost twenty years (since the '80 at the end of the 90s), bringing it to the attention of national magazines. It is precisely in this period that the establishment of a new local government, to be interpreted in relation to the period of "spring of mayors" in Italy, takes place, which seeks to promote a renaissance in Gela also through the development of a new PRG.

The planners, coming from a renowned urban planning studio in Palermo, receive a political and planning commission directly from the mayor. The designers describe "the urban system of Gela (...) as a potentially rich series of settlement episodes (...) even if already compromised in some points, so much so that the sequence of episodes is difficult to read and is chaotic and extremely deficient in the structures" (Municipality of Gela and Urbani & Associati 1996: 28). They try to resolve this fragmentation by providing "centrality of services" in the empty spaces between the offshoots of illegal settlements. In addition to this project proposal, they combine an articulated study of the transport and infrastructure system whose deficits identify the solution in the partial variation of the railway route, to be partially buried, and in the construction of an additional high-speed connection axis in the ring road northeast of the town. The functions and basic sewing elements of the "necklace" of the settlements are in fact largely entrusted to and represented by the transport lines. Although in the 90s a series of events had already highlighted the widespread environmental damage in the entire territory of Gela, and several citizens had already self-organized to denounce and propose alternative types of

development, the urban plan makes no reference to that. In it, the theme of risk is treated only in hydrogeological and seismic terms. A generic reference is made to environmental degradation, however, declining it exclusively in matters related to the degradation of the building heritage. As the designers of the plan write in the master plan "if recovering the possibilities and potential of a territory means mobilizing all entrepreneurial and working vitality, applying it according to modern organizational and technological skills to its" real resources "and making them pass to sustainable development by speaking of a city, however, the problem of recovering its housing and building heritage when it is degraded always remains in the first field. For Gela it is necessary to urgently pose the problem of "productive recovery", but it is more than urgent to immediately deal with the urban and residential recovery" (Urbani et al. 2010b: 60). Again, in another passage: "the building decay has favored the increase in social decay and it is precisely a physical environment of the type that has taken place in Gela holding back the momentum of an economic recovery which at the same time is the modernization of the entire production system" (Urbani et al. 2010b: 62). Basically, the central theme of the PRG is illegal building in its dimension linked to decorum and the need for infrastructure, rather than to the profound social problem underlying it. Despite the formation methods of the PRG being presented as being extremely innovative, cutting-edge and based on dialogue with citizens, the path of the plan was much more tortuous and, in any case, less transparent than one might think

"We have organized a series of meetings with stakeholders. The planners presented the general outline of the plan to these stakeholders and they could interact and ask questions or clarify doubts to the planners" (Franco Gallo, former mayor, interview April 2021)

"At the time I was a young urban planner, I had recently graduated and specialized in the formulation of the environmental impact assessment which at the time had generated a wide debate on the role of citizens. Full of enthusiasm, I tried to bring this breath of fresh air into the plan formulation process. Imagine that we are at the beginning of the 90s no one was talking about participation, and even less in Sicily! (...) you must understand that it was difficult and there were no economic resources to support these participatory initiatives. It was all done on a voluntary basis and only because I was pushing in this direction. But then from the end of the 90s I left the profession to devote myself completely to the academy and I no longer know who and how followed the process" (Prof. Dino Trapani, interview April 2021)

Although some meetings actually took place, nothing comparable to certain genuinely participatory and emancipatory paths underlying the planning process took place.

"In practice, every time there was some material ready, a public meeting was organized. We showed our works and then one by one whoever wanted could ask questions on the spot or later contact us to make specific exchange proposals. It was a diplomatic and cut-and-sew job that lasted for years" (Ing. Puleo, Interview April 2021).

The process of the plan was anything but linear. The first draft of the plan and the publication of the master plan took place in the early 90s, its final approval in 2010 (Urbani et al. 2010a, 2010b, 2010c), the final approval which also absorbed the changes deriving from the urban mobility plan, which took place in 2017⁸¹. These interruptions and delays occurred both due to the lack of economic resources and for political vicissitudes that implied, at the end, the resignation of the “spring mayor” of Gela. It should be noted that during these twenty years, from the first draft of the plan to its approval, there have not only been many changes in Gela but also in the way of planning. That is, the plan was already old both in content and in the elaboration process when it was first approved in 2010, let alone in 2017! Furthermore, from the analysis of the plan it emerges that the data used concerned the employment balance, migratory balance, unemployment rate, census data, crowding index, i.e. mainly quantitative data was used, the value of which is undeniable, just as their intrinsic limit is undeniable. Although it is obviously lacking in the ability to read deeply environmental and social risks, it must nevertheless be recognized that there have been timid attempts to make it innovative in the process.

Regarding the public policies and urban planning tools of the PRG presented above, some issues may be highlighted. The two regulatory plans are both lacking in dealing in depth with the issue of social inequalities and their spatialization, in addressing the environmental issue, and in the type of tools they mobilize to build that knowledge to refer to in order to develop project proposals. In fact, both regulatory plans have the limit of having used classical demographic data etc. as main tools, without accompanying these with further investigations with alternative and complementary methods, such as interviews, qualitative insights etc. The process of building knowledge purely linked to statistical, quantitative and expert data has had the direct consequence of reproducing that typical effect of “creative delegation” (Saija 2012: 15) already presented in chapt. 1.3. The second and final master plan has attempted moments of opening, thanks to the presence on the one hand of an administration that has tried to be open and innovative, on the other by a relatively experimental group of designers and urban planners. However, this attitude open to listening has mostly taken on a discontinuous character over the years, unidirectional (i.e. the designer explains the contents and responds to any feedback from the audience) and finally punctual, i.e. often linked to a specific dialogue between the planners and specific requests from private parties. The innovative potential initially stated has therefore been greatly reduced in practice. Furthermore, the long vicissitudes of the municipal council, which led to the resignation of the innovative mayor, accompanied by a turnover of the architects' technicians, as well as the time span between the first client in the early 90s to the effective approval of the plan urban in 2017, has become a source of discussion and citizen debate. In particular, in the proximity of the first approval in 2010, this civic ferment has generated new awareness and new local subjectivities. Between 2010 and 2017 the new

⁸¹ The information regarding the recent PRG refers to the following documents: the General Town Plan of the Municipality of Gela was adopted with commissioner resolution n.60 of 2010 and adopted on 12/10/2017 with DDG n. 169.

version of town plan together with the detailed plan of the mobility were enforced, this time, for the first time, by also involving part of the civic society. According to some interviews, the elaboration of the plan became a moment of vibrant ferment.

"I remember with pleasure the moment of the elaboration of the observations. We organized meetings between us citizens, sometimes we met inside a church, other times inside someone's home or inside the headquarters of an association and we reviewed together some parts of the plan to understand what we could propose to improve it (...). On that occasion I got to know very competent people from whom I learned many things and continued to collaborate later on" (Arch. Adriano Marchisciana, October 2020)

"Although I have always been a lover of the environment, a topic that was much debated concerned the liberation of the medieval walls. I proposed to tear down all the buildings near the walls to put them in good view and enhance them. Not all the other associations and citizens agreed, so in the end, by majority, we decided not to propose this change in the plan. What a pity! I think it would have been a good idea!" (Emilio Giudice, president of the Biviere nature reserve, September 2020).

These excerpts of interviews with some citizens and activists of Gela reveal that, despite the apparent civic apathy, there was and still is a "desire for citizenship" that found it difficult to express itself and that, on the few occasions offered by the public administration, did not hesitate to carve out a space for critical positioning and action. This fervor expressed on the specific occasions of the elaboration of the observations on the urban plan, however, was not followed by a structured attempt by the public administration to propose a place of sincere and continuous dialogue with citizens, nor, on the other hand, by a permanent citizen mobilization that firmly requested such proposals from the public administration. Finally, another aspect to highlight is the almost total absence of the environmental theme, if not declined in terms of urban quality through the improvement of urban planning standards relating to green and public space. Despite these solutions of concentration of services in the most abusive neighborhoods, it is undoubtedly an improvement solution, this fails to include the more general state of insecurity and environmental and health degradation that characterizes the life of the inhabitants of Gela, as I will explain better in chapter 3.2. The plan seems incapable of intercepting and providing spaces and tools to listen to, identify and collect all those forms of insurgent knowledge and practices present in the Gela area and from which to learn and / or to be included in the planning process. At the same time, the issue of risk is mostly dealt with in terms of hydrogeological risk and seismic risk, without there being a holistic approach to risk. Even more absent is some form of recognition that the town of Gela is an integral part of a constellation of "slow-burning" risk landscapes. All these critical reflections are simply absent within the two urban plans.

An attempt to structure a participatory path that is open towards civil society can be found in the elaboration of the Urban Sustainable Mobility Plan (PUMS). Since the PUMS is connected to the Strategic Environmental Assessment of the town of Gela, it had to foresee and demonstrate, at the procedural level, the consultation with the stakeholders of the territory. Drafted in 2013 and adopted by the Municipal Council with act n.19 of

31/01/2017, the PUMS has been adapted to the provisions of the PRG. What is interesting is that the PUMS formulation process went through several participation meetings with 6 thematic tables, administration of questionnaires and elaboration and publication of the reports of the meetings. The results of this work include the identification of environmental islands, the construction, completion and improvement of road infrastructures. Although in an almost consultative way, the PUMS is remembered by the citizens and activists I met as an important achievement both for the contents and for the participatory process.

“The first discussions on mobility in Gela began to take place in 2013 with the drafting of the urban plan for sustainable mobility to which we contribute as an association. Then it was approved and adopted last year at the end (...). We were able to sit at a table with the designers, and as we are the only association with this background, we already had considerable documentation with respect to mobility projects. In the end we were mainly listened to by the designers” (president of FIAB Gela)

This interaction between public actors and civil society has therefore brought positive results. However, I would like to make some critical reflections on the application of this urban planning tool. The first question concerns who can participate. The stakeholder involvement system follows a transparent but relatively inclusive practice. Another issue concerns the fact that the PUMS does not address the issue of environmental risk, except by declining it in the softer environmental aspects related to environmental quality and the improvement of the quality of life through the increase of soft mobility. Although these are interventions of undeniable value, this inability to face the problems linked to slow and widespread contamination can be found in all the traditional urban planning tools applied in Gela, including the remediation plan which I will discuss in the next sections.

While the PRG and the PUMS are urban planning tools that are mainly applied at urban scale, a different planning tool is the regional landscapes plan. It is worth pausing on this sovra-local urban planning tool in order to shed light on the shortcomings of planning in all scales of intervention. The landscape plan prevails over plans and programs with a territorial and local impact which therefore must comply with what is indicated in the regional plan. Coordinated at regional and provincial level, the Sicilian regional plan is in turn divided into provincial plans for a total of eight provincial landscape plans. Gela, located in the province of Caltanissetta, is dealt with within the section of the Sicilian regional plan referring to Caltanissetta, the only province to have adopted but not yet definitively approved. It is in turn divided into the so-called "local landscapes" on the basis of criteria of contiguity and similarity of geographical, physical, natural and cultural characteristics. The area of Gela is divided into the following local landscapes: the local landscape 16 corresponding to "the plain of Gela" (Soprintendenza per i Beni Culturali ed Ambientali di Caltanissetta 2020: Art. 36); the local landscape 17 corresponding to the "urban system of Gela" (ibidem: Art. 37); the local landscape 18 corresponding to the "Biviere di Gela" (ibidem: Art. 38). For each of these individual local landscapes, in addition to a descriptive section, the plan identifies the degree of protection with a value ranging from 1 (low level of protection and constraints) to 3 (maximum level of protection and constraints). In addition

to the protection of the areas ascertained and restricted in accordance with national laws, the regional landscape plan identifies the areas of archaeological interest, promoting their active protection to allow their protection and enhancement for scientific, educational, and cultural tourism purposes. The Plan pursues general objectives, which are: ecological stabilization of the environmental context, defense of the soil and biodiversity, with particular attention to situations of risk and criticality; the enhancement of the identity and peculiarity of the landscape of the province of Caltanissetta, both as a whole and in its various specific configurations; the improvement of the social usability of the environmental heritage, both for current and future generations; safeguard the widespread landscape, environmental, morphological and perceptive values and the visual enjoyment of the scenarios and panoramas; to promote actions for naturalistic and eco-systemic rebalancing for the purpose of environmental-landscape requalification; to protect territories with a high landscape-environmental value, with particular reference to the system of historical and monumental interest and to agricultural landscapes subject to processes of degradation and anthropic transformation. The landscape plan provides for the consolidation and requalification of the natural heritage; the extension with the organic integration of the system of parks and reserves; environmental recovery of degraded areas; the consolidation of heritage and agroforestry activities; the conservation and restoration of the historical, archaeological, artistic, cultural and testimonial heritage; urban and territorial reorganization; the identification of a framework of interventions for the promotion and enhancement of cultural and environmental resources. Despite these objectives, from a regulatory point of view this plan maintains a mostly limiting and binding characteristic. Furthermore, it does not take into consideration the role of insurgent knowledge in the processes of identifying and mapping areas of environmental value or areas subject to various types of risks. Although this plan attempts to carry out a total census of landscape heritage at the regional level, it fails to include insurgent knowledge that can generate maps of unusual landscapes, as well as collect and use small data to reveal transformations and evolutions as well as the risk to which such landscapes are subject. In short, its process of elaboration, drawing up without any kind of involvement of lay people, is another lost opportunity for social and democratic innovation!

Management Plan of Natura 2000 sites: An “Environmentalist” Plan

Quite different and interesting is the story of the Management Plan “Biviere e Macconi di Gela” (Agostini et al. 2003; Giudice et al. 2007) that was elaborated by a group of ex-environmentalists who were able to get into the institution by becoming the authority managing the natural reserve including the Site of Community Importance and the Special Protection Area of “Biviere of Gela”. The expertise collected through their experience as activists and environmentalists was merged into the management plan. The management plan of a Natura 2000 site is a planning tool foreseen by Article 6 of the Habitats Directive, which is used to formulate the site’s conservation objectives together with the measures necessary to attain these objectives. Management

plans are not mandatory, but they are implemented if deemed necessary to achieve the purposes of the Directive.

The Natura 2000 concerns an area that is included in the territories of the provinces of Caltanissetta, Catania and Enna, it concerns in particular the whole area with special protection SPA for a total extension of about 179 km², falling within the municipalities of Acate, Caltagirone Niscemi, Mazzarino, Gela, and Butera, plus an external area of community importance (SIC) of 1.38 km² called Rupe di Falconara. It should be noted that, however, within the SPA area mentioned above there are SIC areas such as: Biviere and Macconi di Gela (36.66 ha), Sughereta di Niscemi (about 8 ha), Torre Manfria (6.88 ha). These activities began in December 2007, when the Sicilian Regional Authority for the Landscape and Environment, in order to create ecological networks, started redrafting the management plan for three sites. The task was given to the Italian League for Birds Protection (LIPU), the managing authority for Biviera di Gela, which coordinated the plan inside the site. Many of the actions in the management plan were related to requalifying the coastal landscape, seen as a specific unified landscape, where most of the previously mentioned ecological, structural and cultural imbalances were present. The many actions taken under the aegis of the management plan in this area were designed to protect and connect the remaining natural areas, through actions aimed at creating new landscapes, which took into consideration the natural resources, the historical agriculture, and culture of the sites. In the ambit of the LIFE Leopoldia project⁸² some of the initiatives planned had to be carried out over a period of three and a half years, from October 2012 to the end of April 2016.

The management plan implemented in “Biviere and Macconi” was approved by the competent department of the Sicilian Region in May 2016. It consists of a technical report with 20 annexes and 74 maps. It was implemented to define a new landscape asset, suitable to protect this area with high ecological value (Russo et al. 2011). The main objective is to protect those habitats and species existing in the site, identified in Directives 92/43/EEC and 79/409/EEC, through actions aimed at increasing biodiversity.

This plan is divided into several parts. The first section is dedicated to outlining the cognitive framework relating to the characteristics of the site. The second section reports a summary of the environmental criticalities (habitats). The third identifies the objectives of the plan. The fourth is management strategies. The fifth and last concerns the monitoring plan and the territorial information system. Unlike the other planning and regulatory tools analyzed so far, which take on an anthropocentric perspective both in identifying the problem and in the formulation of possible solutions, the management plan has an eco-centric vision that emphasizes all ecosystem components altered by anthropogenic activity. The plan aims to preserve these ecosystems and restore compromised ones when possible. For example, the plan highlights how in general the SCI area is characterized by high naturalness values for birds, from which Community and international

⁸² LIFE is the EU financial instrument supporting environmental, nature conservation and climate action projects throughout the EU.

recognitions (Ramsar Site) and residual phytocoenosis worthy of attention (with presence of priority species) as indispensable for the survival of the fauna itself. This environmental value is compromised by an excessive load of agricultural activity with respect to natural environments. The redevelopment objectives of the SIC are based on specific interventions to remove the main causes of degradation, and preventing new environmental threats within the SIC. To this end, one goal is to safeguard the lake system from currently existing imbalances, to recreate natural environments within agricultural areas, in particular greenhouses, to create a network of vegetational connective (ecological corridors), large enough to diversify the agricultural territory. To give an example, among the interventions planned for example in the Lord's Plain, there is the creation of some temporary wetlands.

A peculiarity of the history of this plan is that it has its own roots in the long struggle carried out by an environmentalist of Gela, Emilio Lo Giudice. Co-founder of one the first branch of Legambiente in Gela, then disappeared, and passionate of nature and birds, Emilio Lo Giudice denounced the risk of the slow and diffused environmental contamination in an unsuspected period, i.e. in the '80s. His long battle was both scientific, political, and personal, almost individualistic. It was scientific because he used all the tools in his possession to prove scientifically the priceless value of the natural ecosystem in the plain of Gela that were degraded due to the human footprint through both industrial activity and intensive agriculture. Emilio has involved freelance researchers, PhD and master students and has started up long-term collaboration with several university and research labs. He also set up an online open access archive in which he stored all the research produced over time. It was political because he was using this scientific knowledge as a way to have his denunciation heard but, above all, as a way to have his requests politically acknowledged. A consequence of this political pressure was the inauguration of the natural reserve of Biviere. The obstinacy of Emilio Giudice, together with other activists, has allowed to achieve the incredible goals of having a natural reserve precisely where the environmental neglect was increasing while not recognized. From the stronghold of the Biviere Reserve and ensured by the existence of numerous laws, Emilio Giudice can now have an institutional role in indicating constraints and directions of development. This battle has meant for him exclusion and mistrust, especially from people interconnected with the petrochemicals, who see him as a threat for their job. The Management plan represents a crucial step of this long passionate scientific, political, and personal battle.

“Are you asking me where you can find the thousand studies, surveys, and researches that I made alone or with other notorious scientists during all these years? This is simple! Just read the management plan. You will find all my years of struggle there” (Emilio Lo Giudice, October 2020).

In this case, quite interestingly, the autodidactic scientific knowledge merged together with the activism background are at the origin of a plan having European and international recognition.

A Plan of Remediation in need of Remedy

The last regulatory tool I want to dig into is the remediation plan of Gela. The Sicilian region with act n. 26358 on 25 May 1988 submitted a request to the Ministry of the Environment for the declaration of Gela as an "area at high risk of environmental crisis". Two years later, the area consisting of the territories that fall within the Municipalities of Gela-Niscemi and Butera was declared an "area at high risk of environmental crisis" by resolution of the Council of Ministers on 30 November 1990. For these areas, the law provides a specific recovery plan. The clean-up plan for environmental remediation was developed with the Presidential Decree of 17 January 1995. Subsequently, with Law 426/98 that of Gela is counted among the top fifteen sites of national interest in the National Remediation Program. The ground area of the interventions, defined by an act of the Ministry of the Environment of January 2000, covers an area of 4.7 square km which includes the industrial center, the oil storage centers and related pipes and the landfill of special waste. The surfaces at sea are equal to 46 square km, between the Gattano and Birillo streams. Finally, the program includes the Biviere Lake Reserve and the streams in the area.

The rehabilitation plan approved in 1995 is a tool with high potential for the contaminated landscapes of Gela. It is aimed at identifying urgent measures to remove environmental [risks/hazards/threats] and restore the area. Developed by the Ministry of the Environment in agreement with the Region of Sicily, the recovery plan provides for "direct measures" which are:

- Reduce or eliminate the phenomena of environmental imbalance and pollution and the construction and use of systems to eliminate or reduce pollution
- Supervising the types and methods of production and the use of devices for eliminating or reducing pollution and development phenomena
- Ensure supervision and control over the state of the environment and the implementation of interventions.

The rehabilitation plan came to the proposal of such direct measures after having drawn up a study divided into two main phases: the cognitive study on the state of the environment and the definition of the rehabilitation program to be carried out. I want to focus on the cognitive study concerning the state of the environment and which is aimed at the "recognition of environmental imbalances and polluting sources". From a more in-depth reading of the plan, it is clear that the data and information available have been analyzed and, when possible, checked, with the aid of appropriate verification methods, a program of on-site inspections, and the scientific literature on that theme. In the light of this study, the plan reveals a rather uneven and / or lack of information and data, especially those relating to pollution. For example, the assessment framework on the state of atmospheric pollution is particularly lacking in terms of the characterization of volatile organic substances and non-ubiquitous pollutants, because the air quality detection networks are unreliable. For this reason, the plan emphasizes the need to proceed immediately, in parallel with the start of the remediation activities, to a systematic monitoring of the various critical environmental variables. The attention of the analysis was mainly

focused on the problems of water supply, water purification, waste disposal and / or treatment infrastructures, energy production infrastructures and transport infrastructures. The cognitive framework made it possible to indicate in the plan the main causal factors of pollution and environmental and territorial degradation. In particular, among these, the presence of industrial activities that implement production processes with a significant environmental impact both for the type of raw materials treated (oil and derivatives) and for the products (hydrocarbons such as gasoline, LPG, etc.) is relevant. The most significant causal sources are those represented by industrial settlements and are: the Prail refinery; the Enichem Anic plant for the production of basic chemical products such as ethylene, acrylonitrile, glycols, etc.; the Enichem Polimeri plant for the production of polyethylene; the enichem agriculture plant for the production of fertilizers; the Isaf plant for the production of phosphoric and sulfuric acids.

The activities of study and processing of the information available in relation to the various environmental, territorial, and socio-economic sectors, with regard also to the aspects of major accident risk present in the area, have allowed the formulation of a cognitive picture of the state of the environment and of the main dynamics in place through the identification of the state of degradation of environmental resources, the relationship between this and the levels of use, and when possible the identification of the causal sources of impact and risk. In consideration of the current knowledge deficiencies reported, the plan states that it is appropriate to promote, in particular as regards the control of industrial emissions, an approach to remediation based on the adoption of the best available control and purification technologies (BAT-Best Available Technology). In my opinion, from what has been presented up to now, critical comments can be made on which cognitive tools have been mobilized to build knowledge aimed at the elaboration and proposals of the plan. The plan does not include or refer to citizens and their insurgent knowledge. In addition to this, the plan places total and exclusive trust in technological advancements to both understand and reduce the contamination present in the Gela risk landscapes.

Furthermore, the Recovery Plan, as it itself states in its Objective 4.1 (Presidential Decree 17 January 1995: 27) "must therefore not be limited to being a programming and environmental and territorial planning tool, but must constitute a procedural tool that is the origin of a process of direction and management of the recovery initiatives. and environmental protection, related and linked to the territorial and socio-economic context of the area concerned". Despite these good intentions present in the plan, it is good to highlight how the plan has encountered multiple slowdowns over the years, and the recovery plan is still under remediation, despite being approved in 1995. The most important interventions the specifics envisaged by the plan present some critical issues. A system of integrated environmental monitoring to allow the various environmental components and critical indicator parameters to be monitored continuously and with sufficient uniformity and extension, however this system does not present any flexibility and openness towards alternative territorial knowledge. Furthermore, an environmental information system is envisaged which has not actually been implemented.

Furthermore, the plan indicates which areas will be reclaimed in the short-medium term, with particular reference to the most critical situations of soil degradation, consisting of uncontrolled landfills⁸³. The plan also provides for the construction of new plants for the treatment and disposal of industrial waste aimed at ensuring the satisfaction of the area's needs. The plan provides a time schedule of the planned interventions indicating the estimated cost for each intervention. Regarding funding, the equivalent of over twenty million euros was initially allocated. However, this money remained largely unused for over five years, the works were slowly started in 2010. These funds were allocated to finance a total of 47 interventions, of which 14 are borne by companies (mainly headed by ENI) and 33 by the state. From the point of view of the interventions carried out so far, there is a part of the work that is carried out by ENI Rewind which also operates on behalf of the Gela refinery, Versalis and EniMed. Eni's environmental company is the owner of the reclamation costs of the former ANIC areas (approximately 17 hectares) and manages the demolition activities of the ISAF⁸⁴ assets distributed over approximately 55 hectares (Plot 9 and former phosphogypsum landfill). The activities include emergency and permanent safety measures, the demolition of some production plants, soil remediation and the maintenance and monitoring of the water treatment plant. Eni Rewind has started all soil remediation activities that include interventions in ISAF islands 2, 6, 9 and 17, favoring the application of the Multi-Phase Extraction technology in situ, and permanent safety measures at the island 1. On plot 10, the reclamation of unsaturated soils has already been completed. The demolition of the Acrylonitrile plant was completed on island 17. The reclamations in the other islands are still in progress. Eni believed it had fulfilled its duties with the activation of the SNOx useful for filtering petcoke. In March 2021, Eni Rewind started the demolition of the plants no longer used, which will lead to the recovery of free areas for new industrial activities and to the reduction of the visual impact of the former petrochemical plant. The interventions are already underway, for an estimated cost of over 25 million euros. By 2021, they announced that they will complete the demolition of the SNOX chimney, the G300 thermal unit and the Coking 1 and 2 drill structures. Finally, in 2017 the works relating to

⁸³ There are two quite emblematic examples regarding the illegal landfill in the plain of Gela. A first example is the endless judicial process trial regarding the so-called "Ex Cipolla landfill". In the past it was used to store hydrocarbons and production waste, often outside the quantities allowed by law through tacit agreements with local criminals. Today the "Ex Cipolla landfill" represents a source of danger and contamination. The remediation works were only partial and are still incomplete. A second example comes from the declarations by Emanuele Pristritto. Owner and operator of mechanical shovels, now retired, for many years Pristritto was the holder of contracts in the sector of earthmoving and raw materials in the ENI plant. In November 2018 he gave a testimony in front of the cameras of the "Nemo" program live on Rai2 (national television channel). He revealed sensational episodes of soil and subsoil pollution with industrial waste from the ENI petrochemical plant. According to his interview, the waste from the chemical processing and refinery would be buried in large tanks of more than 500 square meters and 15 meters deep, east of the petrochemical. Countless types of industrial waste would be dumped inside.

⁸⁴ Industria Siciliana Acido Fosforico-ISAF (Sicilian Industry Phosphoric Acid).

the second phase of the reclamation project of Tank A, an old landfill, were started. authorized present in the refinery.

With regard to the action of public institutions, what they have achieved so far is the characterization and remediation of a former waste landfill, the construction of sewers, the doubling of a wastewater treatment plant and the creation of pollution detection networks. Ultimately, the number of remediation works carried out appears at the moment reduced and substantially inadequate to the environmental state of the area. In the past twenty-five years, there have been many practical obstacles, of a political and financial nature, which have made the reclamation plan slow in its implementation and gradually less ambitious. The slowness of the remediation process favors the emergence of doubts about the effectiveness of the administrative machinery and questions about the nature of the possible interests that slow down the execution of the works (Waste Commissions 2007). Responsibilities are distributed more or less evenly along the various administrative levels involved (local authorities, region, state). However, previous studies suggest that this process must be interpreted in the light of the particularities and interests, which are not always legitimate, of restricted groups (Saitta 2009). It should be kept in mind that the reclamation economy is extremely delicate and constitutes a privileged field of action for the "eco-mafias" (Legambiente 2003). A large area of the provincial territory appears to be characterized by the presence of a dangerous form of organized crime, which has incorporated significant segments of local business and also of public administration. It is evident that the allocated resources constitute an objective for the speculations of this criminal entrepreneurship and that the contrast to the infiltration process requires extreme accuracy, generating a surplus of slowness that is added to the "physiological" one, deriving from the jagged relationship that characterizes the forces social and political issues of the territory. At the same time, the feeling is that the recovery plan, as well as the other environmental and public works, generally have a much more extensive value than the literal and technical one. A value that could be defined as symbolic and communicative. Environmental remediation is an issue that generates widespread social expectations and its management methods tend to raise collective interpretations which, in the common framework of political distrust, can only be negative and even "conspiratorial". The recovery plan is a crucial tool both for the symbolic and collective meaning it assumes and just mentioned and because it aims at the real restoration (or attempt to restore) of some degraded ecosystems. However, the plan is deficient at least for a series of issues that briefly concern the cognitive tools at the basis of the construction of the cognitive framework of the landscapes of Gela exclude any form of listening, interaction and engagement with the inhabitants of these contaminated places; the interventions are concentrated where the source of pollution is supposed to be, this approach conceives the damage as merely punctual and therefore does not take into consideration the quantitative and qualitative extent of damage spread over time and space; finally, the long time frames and the not always transparent and efficient ways of managing the plan have become a factor of further exclusion of local communities who feel powerless and have no say in the matter.

Final Remarks

This section of my dissertation highlights the limitations and potentialities of the mainstream approach of planning to the risk landscapes by means of the concrete analysis of the planning tools and normative that have been enforced in Gela. I am aware that I have not scrutinized all the normative frameworks, rather I have picked some of them that I believe can provide some useful insights on the shortcomings of the general planning trend. First, I have described the landscapes of the plain of Gela giving a multi-temporal and spatial account of its transformations over the time, without, however, describing the relationships between the human ecology and the physical landscapes over time. This occurs because in the plans' account is prominent the physical description of the characteristics of the landscapes of Gela both in aesthetic, morphological, archeological, and ecological terms. The story of landscapes of Gela from an urban planning laws and tools point of view has unveiled and further corroborated that it is reductive to talk of environmental risk without talking of socio-economic injustice. The town of Gela grew quickly and disorderly, with large deficiencies in primary and secondary infrastructures and with a high population crowding, creating the conditions for the vast phenomenon of unauthorized development. The poorest classes started to illegally self-construct huge settlements in the less prestigious areas that were along the plain, not in direct contact with the sea and instead closer to the plant. The abrupt urban development of Gela, occurred as a consequence of the equally abrupt process of industrialization, has confirmed and amplified the existing social inequalities and it has created new ones. Illegal self-organization, based on what could be called an "amoral urban development/real estate market familism", is the effect of a social inequality that the construction of the plant has exacerbated rather than reduced. However, it is worth pointing out that a different type of urbanization (also geographically speaking) occurred for all those bourgeois classes or those workers directly connected to the industrial plant who had the chance to settle in new fancy buildings inside the gated community of Villaggio Macchitella or in new spacious houses in Caposoprano overlooking the sea. This is to say that, at a closer look, it can be seen that the urban story of Gela's urban development reveals the spatialization of social inequalities between social classes. Nonetheless, what emerges from urban plans and projects is that the attention was mainly absorbed by the crucial theme of lack of regulation in a morphological key above all relating to urban decoration issues, without there having been an attempt to deeply interpret the inequalities and social discomforts underlying this illegal urban development. Particularly emblematic in this regard is the case of the ex novo project of the Macchitella district which has been purposely located far from the petrochemical, separated from the city and equipped with a whole series of services that the rest of Gela did not have anywhere near (public green, park games, lift, running water etc.). In the absence of public policies capable of intercepting the needs of the inhabitants, the construction of the building market took place in a self-organized manner leading to a "wild" and poor-quality building development, especially for all those social groups of sub-proletariats and in conditions of semi-indigence. Unauthorized construction hence demonstrates the failure of the role of the state to reconcile the contradictory, if not opposing needs of autonomy (individual, of citizens) and of the institution (public, of collective interests). In fact, in Gela the State has frequently used to tolerate the numerous forms of illegal

constructions due to the absence of its own production of public housing in the number necessary to satisfy the demand, and also for a calculation on the political consensus obtainable and an evaluation of convenience on the cost of the policies of sanction and repression. Therefore, the urban story of Gela demonstrated also how the modernist planning, its laws and normative were not able to handle such complexity. These are not the only limitations. The main urban plans, tools and hats that have been applied in Gela present several shortcomings, especially in the way they have dealt with the construction of risk knowledge aimed at future actions and projects. All the *iter* of decisions have not been transparent, instead they have been the fruit of top-down decisions that totally exclude any kind of interaction with lay people and their potential insurgent knowledge of their daily places of life. Except for the Management Plan of Natura 2000 network, which was the outcome of a long environmentalists' battle, other planning tools reproduce traditional procedural modalities giving experts any creative delegation. In addition to these aforesaid critical points, another point can be underscored by delving into another planning tool more specifically dealing with the risk topic: the remediation plan. Not only in this plan can the same limitations of the other laws be found, but also it also may clear the normative difficulties to frame and deal with the slow disasters spread over space and occurring slowly over time.

3.2 A Quantitative Account of the Risk Landscapes of Gela

In this section, I will tell the story of Gela from the perspective of the mainstream way to produce knowledge on risk landscapes. In particular, I briefly display the main types of quantitative sources that make up the foundation of the mainstream expert knowledge so far-produced on Gela. This review of environmental and health data aims to demonstrate how much such information is extremely valuable in order to comprehend risk landscapes, as well as, at the same time, are not enough to grasp overall the multi-nuanced forms of knowledges embedded in the human and more-than-human communities, as well as, not enough to envision alternative futures. I will also show how, in any case, such mainstream expert knowledge has not yet been able to cover in a comprehensive and exhaustive way even all the lacking quantitative information regarding the risk landscapes of Gela.

According to ISPRA (2019) —the Italian Institute for Environmental Protection and Research— Gela is one of the 12,482 contaminated sites throughout Italy and one of four Sicilian areas among the 58 Italian RSINs waiting for remediation work. Sicily is second only to Lombardy for the total number of RSINs, quite an astonishing position considering that Lombardy has always been the industrial engine of the nation, while Sicily does not have the same economic profile. The RSINs in Sicily are Priolo-Melilli-Augusta (Siracusa), Gela (Caltanissetta), Milazzo (Messina), and Biancavilla (Catania). Three of them are petrochemical poles and industrial areas in operation or in a transition toward something else (green refinery, etc.). The establishment of those industries in Sicily was the product of a state-led strategy aimed at developing the Italian South after World War II, a strategy that did not allow any form of grassroots participation in the decision-making process. After sixty years, it is clear that those industries have not delivered the expected systemic changes they were built for⁸⁵, while they did affect the areas where they were placed, jeopardizing the environment and people's health. According to scientific research, Gela concentrates the socio-economic and environmental drawbacks of such top-down policy, to such an extent that the sociologists Eyvidin Hytten and Marco Marchioni coined the expression "industrialization without development" (Hytten and Marchioni 1970) to describe the discrepancy between the triumphalist narration on prosperity coming from industrialization and the reality of Gela, characterized by job blackmail, citizens' distrust, and lack of transparent democracy. The socio-

⁸⁵ According to ISTAT (2018, 2020) 10% of the residents in Southern Italy live in a state of absolute poverty, whereas in Northern Italy it is 6%, and the average in Italy is 7%. The percentage of early leavers from education and training is around 19% in the South, 12% in the North, and Italy's average is 14.5% (ISTAT 2015). The rate of unemployment is around 18% in the South —one of the lowest in the European Union, 6% in the North, whilst the national average is 10%, similarly, the youth unemployment rate (15-24 years) is about 50% in the South, whilst the Italian average is 29.6% (ISTAT 2019).

economic disruption finds confirmation in the national census data (ISTAT 2011a) about families in a state of deprivation (7.8%) and the unemployment rate in Gela (26.4 %, which is more than double that of the Italian rate which is 10.2%). In the face of the increase of occupational problems and of public awareness on environmental and health issues, in the 80s vast amounts of public funds were allocated in order to improve the infrastructure in the area of Gela. The investments attracted the interest of organized crime organizations which led to a two-decade mafia war (the 1980s-90s) for control of the territory (Ciccarello and Nebiolo 2007; Becucci 2004). This clarifies why the sociologist Pietro Saitta (2009, 2011) describes Gela as a marginalized place in which the environmental degradation interplays with psychological and cultural deprivation, while the geographer Pierpaolo Mudu (2009) maintains that in Gela both the local community and authorities have internalized the Foucauldian concept of eco-governmentality that has subsumed environment, development and normalization of individual behaviors, assimilating the typical ethic of capitalism, centered on production, individualism, and profit.

Several scientific studies have scrutinized other aspects of Gela. Some have demonstrated the economic irrationality of public investments in industrialization by starting from the (economic) cost of depollution in Gela (Amata et al. 1986), others have presented preliminary hazard assessments for several chemical substances detected in environmental matrices, with the aim of proposing a precautionary approach (Mudu et al. 2014).

Bio-monitoring studies have discovered that the standardized ratios of mortality (1995-2000) and morbidity (2001-2003) by cause and by gender in the Gela area are comparatively higher than in both the adjacent and the regional populations. In particular, there is an increase in mortality from malignant stomach tumors in men; mortality and hospitalizations for colorectal cancer in women; mortality and hospitalizations for laryngeal cancer in men; mortality from tumors of the trachea, bronchi, and lungs in both genders; hospitalizations for bladder cancer in both genders; and hospitalizations for non-Hodgkin's lymphomas in women (Fano et al. 2006). According to more recent data, such as the recent annual health report produced by the regional health department (Cernigliaro et al. 2017), in Gela, breast cancer is the second cause of death for women, while for men it is liver and intrahepatic duct cancer. The report confirms the excess of hypospadias⁸⁶ and the increase of the perception of risk calculated on the basis of multi-factorial indexes, as encountered in other studies.

Health surveillance analyses have found excesses for different groups of congenital anomalies. For instance, from 1991 to 2002, the observed rate of hypospadias was 56.7/10,000 births, 2.5 times higher than references (Bianchi et al. 2006a). Successive monitoring to update the prevalence of congenital anomalies has detected a high rate of congenital heart, genital, and urinary defects (Santoro et al. 2017), and in particular the prevalence of hypospadias of 46.7/10,000 births between 2003-2008 (Bianchi et al. 2014), and of 46.1/10,000 births

⁸⁶ Hypospadias is a congenital defect in which the opening of the urethra is on the underside of the penis instead of at the tip.

between 2010-2015 (Zona et al. 2019), which is a statistically significant excess compared to European and Italian reference values, of 1.7 and 2.3 times, respectively. A case-control study conducted in 2004 for the local prosecutor, despite low statistical power, signaled significant risks of congenital anomalies for consumers of local fruit, vegetables, fish, and seafood, linking statistics of diseases with exposure assessment and lifestyle (Bianchi et al. 2006b). Given these emerging disease cases, the National Research Council and the Ministry of Health have conducted three epidemiological studies — “Sebiomag” “SEpiAS”, “Sentieri”— in order to analyze the state of health of populations living in proximity to contaminated areas and to investigate the link between the cause of death and of diseases with exposure to contaminants. Sebiomag has confirmed the excessive values of toxic substances in residents’ bodies, especially arsenic (Cori 2009a; 2009b). In Gela, 40% of human bodies contain a high concentration of inorganic arsenic (Cori 2014) that, according to the International Agency for Research on Cancer, is a dangerous carcinogenic substance. SEpiAS evaluated the relationship between human exposure to arsenic, estimated through environmental pollution data and biomarkers of early health effects, in order to define indicators for an advanced surveillance environment-health system (Minichilli et al. 2013; Cori 2014). The Sentieri project assessed the mortality of populations residing in the RSINs for the period 1995-2002 in relation to two different sources of exposure, environmental and non-environmental ones, leading to the result that it is only "possible" to give an etiological role to the environmental exposure associated with emissions from specific plants (petrochemical plants, refineries, etc.). Since the mortality increases concern pathologies having multifactorial etiology, occurring in places with multiple and heterogeneous emission sources, consequently the causal nexus between environmental exposure and illness remains problematic to prove (Pirastu et al. 2010, 2011). Furthermore, it is worth noting that scientific bio-monitoring and exposure assessment research did not elicit new forms of community-based research, as had occurred elsewhere in similar cases (Morello-Frosch et al. 2009).

Building on this rich production of expert knowledge, both medical and sociological, in the next chapter I intend to explore another knowledge of the risk landscapes of Gela. My argument is that contamination has entered into both the environmental matrices and the bodies of humans and non-humans, permeating the daily life of people beyond individual overt diseases and even affecting the socio-cultural relationship with landscapes. I aim to use small data and toxic autobiographies to shed light on an untold story that will uncover the complex ecological web of human-society-environment relationships while mapping the practices of resistance/resilience enacted by the community.

3.3 An Account of the Mainstream and Toxic Narratives of the Risk Landscapes of Gela

In this chapter, I will go through the mainstream narratives that have impregnated both the public discourse and the collective imaginaries in Gela since the construction of the plant until now . This chapter does not claim to provide an exhaustive and complete review of all those forms of communication through which an official account can be imposed (television, advertisements, newspapers etc.), rather it seeks to unveil the dynamics of silent and slow violence that are nestled in the toxic tales and that have shaped the risk landscapes of Gela.

“The present volume of this journal is entirely dedicated to Gela, to the grandiose petrochemical plant that ENI has built for us in order to use the fossil fuel reserves discovered in the area, contributing in this way to break the old social and economic structures, crystallized since centuries, and generating in this land – glorious in the past - new job opportunities, security, and justice”

(1964 - n.3 /March Il Gatto Selvatico. ENI corporate monthly magazine).

These sentences, at the incipit of a special issue of the ENI corporate monthly magazine entirely dedicated to Gela, well enclose what Hytten and Marchioni (1970: 35) defined as the “triumphalistic interpretation” of the coming of the multinational company ENI in Gela. In this miraculous interpretation, Gela is described as a poor Sicilian town mainly based on farming, agriculture, and fishing, and ENI is the salvific company that, thanks to the discovery of crude oil at the end of the 1950s, brings economic prosperity and social redemption to these marginalized lands. The triumphalistic interpretation is hence modernist in the sense that it is the expression of the mythology of progress that tends to emphasize all the manifestations of a deep renewal of the entire local lifestyle as a direct consequence of the industrial settlement. The two sociologists identify two additional minor interpretations. The “socio-cultural-anthropological” one (Hytten and Marchioni 1970: 39) looks at the contrast and tensions between the traditional rural culture and the rational, modern, and productivistic industrial world. Finally, “the integrationistic interpretation” (ibidem: 42) mostly focuses on the inadequacy of what has been obtained so far from a social development point of view, without, however, questioning the validity of so-far enforced sectoral interventions (Hytten and Marchioni 1970). Although fifty years have passed since these three different interpretations were first envisioned, they are still topical. Especially the triumphalist ENI’s fairy tale about its arrival in Gela has taken each time a different shape over years, until the most recent forms of greenwashing and represents a perfect example of “toxic narratives” that are always told from the same point of view, in the same way, even with the same words, omitting always the same details and removing the same elements which might offer a more critical sense of the context and its

complexity. In like manner of the narrative of injustice, the contamination of the public discourse through toxic narrative invisibilizes injustices while imposing an official truth (Wu Ming 2011, 2013).

Ergo, assuming that the “analysis of the contents may serve as social research” (Losito 1996), I believe that a critical review of the several communicative tools enacted to tell the story of Gela can help to locate the citizens’ perception of the risk landscapes of Gela in relation to the toxic narrative to which they have been exposed. Moreover, all these concrete communicative artifacts (newspapers, magazines, videos, etc.) also allow substantiating with tangible examples the concept of slow violence.

According to Alessandro De Filippo, at the time of the discovery of oil and the first drilling “everyone, absolutely everyone agrees, or rather, firmly and blindly believes that the fate of Sicily must be linked to the heavy industry of oil refining and chemistry” (De Filippo 2016: 169). If it is true that the imaginary always works in a simplifying way, it proceeds by summary generalizations, by forced idealizations that tend to reduce the possible interpretations of complex phenomena and if it is equally true that there is a euphoria for progress and a mounting positivism, sure, solid, a real “form of infatuation” (ibidem: 160), however it is also true that a whole series of factors have facilitated this process of “collective modernist hangover”.

As a matter of fact, the collective dream on the conversion of Gela from an atavistic and miserable reality to a flourishing modern one must be framed in relation to the most general socio-economic condition of the south of Italy in the 50s. As I have already explained in the introduction of this dissertation, the arduous recovery throughout the entire Italian territory from the devastation of the II World War, presented an even worse situation in the south of Italy, where a combination of backwardness and institutional neglect turned Italy into a country with two different speeds. To reduce such a gap, the newborn Italian republic had to show its ability to deal with these disparities rooted in the history of Italy since its unification under the previous, and at this point deposed/dethroned, monarchy. Moreover, the State had to be able to affirm its power even more where independence movements were starting to get a foothold, such as in Sicily with the movement for the autonomy of Sicily. Together with this urgency by the State to consolidate its power within the country, Italy, has actually been a loser of the second world conflict, also needed to demonstrate its power at the international level where new alliances, in the name of global peace, were establishing new geo-economic and political agreements, prelude, by the way, of what has then been defined as “new global liberalism”.

In such a new modern society, the dream of wellbeing is represented by the pressing consumerism made of “objects of happiness” (Ahmed 2010) such as cars, electrical appliances, modern apartments, and a modern lifestyle. This is backstage at the door of the economic boom of the 60s in Italy. The social and economic redemption toward modern wellbeing and the consumerist lifestyle finds its foundational myth in the rhetoric of industrialization. In other words, only massive industrialization can make possible a new modern life. The toxic narrative, which spread and insinuated into the collective imagination, stems exactly from such a framework.

In this perspective, oil is the manna with which to achieve a modern heaven. Precisely in those years that Agip Mineraria probes discovered an oil field in Gela where, as I have already explained, on the push of Enrico

Mattei and an entire ruling class in 1965 the ANIC (now ENI) petrochemical plant was inaugurated, a short distance from the terragni - the humid houses without toilets, inhabited by the poorest. In such a context, the narrative applied to Gela gained a strategic crucial role to further affirm both the State power and the ENI capacity to fulfill its driving force and competitive task.

The mainstream narrative presents a twofold leitmotif: on one side it points at diminishing Gela's past and its community as a marginalized and poor one in need of redemption; on the other hand, to foster the modernist industrial myth as the only way to achieve modern well-being. Both narrative characteristics can be found in both national and local newspapers, such as the excerpts below corroborate:

“A rich and imposing oil city is rising in ancient and sleepy Gela” (Rosso, *La Stampa*, October 26, 1961).

“Where the deserted and sterile swing of dunes was, the scheme of the new oil city is already looming: the tall chimneys of the thermoelectric power plant pierce the clouds of sand, the fertilizer warehouse curves the vaults of the six aisles in the undulating landscape, the geometric architecture of the plastics plant is almost finished, the hieroglyphic planes of the refinery begin to take shape, the quay of the port is already venturing into the waves” (Rosso, *La Stampa*, 26 October 1961).

This tale is about a desolated land that the State is trying to save, acting indirectly through ENI and national top-down strategies. In fact, in 1956 with the establishment of the Ministry of State Investments, ENI was obliged to make investments in the southern regions. The exploration of hydrocarbons in Basilicata and Sicily was indeed stimulated by this public economic support, and the State somehow played a role in the ongoing abrupt development. The State must hence sustain its own political choice by affirming its presence, and to publicize it is one of the ways to do it.

“President Saragat inaugurates the great petrochemical plant in Gela. The population and workers welcome him with festive manifestations of affection, the President of the Republic highlights the value of the initiative of ANIC: the new industry gives jobs to 2700 workers and breaks the hundreds of years of old tradition of inactive poverty of this area – he wishes effective interventions and rapid progress for the South” (Furno, *La Stampa*, 11 March 1965).

However, other newspapers underscore how this showing up of the State happens in guilty delay:

“The Chief of State came to Sicily in order to inaugurate the “town of oil” of ENI. Behind Gela in celebrating, [there is] the reality of a forgotten big island” (Cimino, *L'ora*, 10-11 March 1965).

The State is perceived as somehow responsible for the impoverishment of the South and the initiatives by ENI is lived by the most critical sectors of society as a further imposition coming from the North, as in this article

“A dizzying leap from the "civilization of the donkey" to the "new world of technology and science". On the island, you will meet the peasants who cross the arid estates on the back of a mule or donkey, wrapped in long cloaks, closed in on themselves. Everywhere there is misery. (...) The living conditions have remained those of past centuries. Then suddenly, beyond a curtain of agave, the monstrous laboratory for extracting, refining, and transforming oil appears on the Gela coast. The working-class neighborhood is the pride of urban planners. But in the old part of the town, the petty bourgeoisie finds it hard to understand the new civilization and defines the technicians as "neocolonialists" (Ronchey, *La Stampa*, 11 March 1965).

In the light of neocolonialism may be read also a quotation of one of the famous Mattei's public discourses: “From the North, we are returning to the South with all the experience we [people from the North] have gained” (De Filippo 2016: 214). The critique of the rhetoric that the far South may undertake the liberation path only thanks to the expertise exported from the North is the harshest one that can be found in the press reviews and other documents. No one questions the top-down and disempowerment process behind any decisions, no one brings in the environment topic, no one questions the progress and the blind faith in a certain type of science and technological advancements. If "class justice can be claimed against industry, it certainly cannot be possible to distrust progress" (Toffetti 2016: 13). After all, it is this period during which even the popular Sicilian storyteller Ciccio Busacca has composed a ballad for the occasion of the oil discovery, “Biniditta la scienza” (God bless science), a veritable tribute to the pioneers who made the oil discovery possible in Sicily. This means that the collective infatuation underpinning the mainstream narrative of this period is indeed expressed even through popular songs!

Paradoxically, one of the few criticisms at that time comes from the Church. The South was often described as characterized by both a profound religiosity and, at the same time, by backward superstition that could at times be an obstacle to progress. This rejection by the mainstream narrative of religious consolidated values triggered some criticisms from inside the Church that was worried that the discovery of oil would lead to consumer well-being which, however, also risked destroying human values, leading, potentially, to "spiritual aberrations of another kind" (Frescani 2016: 13; Frescani 2017). No other criticism can be found.

The spread of this blind faith seems to confirm that there is no direction in this narrative; there is no real premeditated script in the enclosure of the control room of those in power (the Sicilian Region or the Ministry of State Holdings) or economics (the firm). Instead, it is a shared transmission, a constant word of mouth, a mantra repeated to exhaustion. Although I may agree on the already mentioned hypothesis that "everyone, absolutely everyone" (De Filippo 2016: 159) really believed that the project through massive industrialization was the only way to start a social and economic redemption of the country, I don't think that only everyone, absolutely everyone, has suffered this "infatuation" (ibidem: 160). On the contrary, it may be shown that someone even acted out such an infatuation.

Especially ENI itself has been the first and main advocate of a certain type of triumphalist and toxic account of the landscape's transformations of Gela. ENI from the 50s was a relatively new State corporation which set foot into the competitive global energy market at that time mostly monopolised by private corporations as the "Seven Sisters" were. In the continuous search for a balance between approval and support by the national State and government and diplomatic and geo-political dialogue with other global actors, ENI, especially under the charismatic guide of Enrico Mattei, has deployed all its communicative "weapons" starting a real "communicative battle" (Frescani 2015: 2).

This is not to justify the toxic narrative, but instead to underline how it was and is a spread strategy on purpose enforced by powerful actors in order to reduce or eliminate any possible alternative view on facts that may be controversial and unjust. In fact, ENI did not hesitate to use all the tools in the field of communication to defend its economic choices and promote its dynamism. Scholars who have scrutinized the various archival documents of ENI, and ENI has highlighted that there was a real project, carefully planned, which provided for a precise narrative, composed of a series of interventions, codified (De Filippo 2016: 67) and which finds one of its greatest expressions in the corporate documentary formula.

The corporate advertising strategies ranged from advertising in newspapers and periodicals to road signs, from the corporate monthly called "Il Gatto Selvatico" and directed by the poet Attilio Bertolucci to the creation of the daily "il Giorno"; from radio advertising to Caroselli (Frescani 2017), and television to documentaries for cinema. ENI has produced many short films for the television program Carosello, the first advertising on Italian television. The author recognizes in these industrial advertising the signs and the most important aspects of the Italian economic miracle that has transformed Italian society into a consumer society.

Carosello was a very popular Italian television advertising show broadcast on RAI from 1957 to 1977. About forty ENI skits specifically designed to be broadcasted with Carosello (Frescani 2017) were found. From these historic comedy sketches you can read between the lines the way in which the change in mentality is represented and how the company itself is the creator and interpreter of these changes. For example, there are scenes of men who are "cool" precisely because they drive cars at high speeds, or of women who are "modern" because they drive, although obviously they cannot avoid their role as housewives who take care of the house, including cooking with gas!

Another tool widely used by ENI and other industrial companies at that time was the industrial video-documentaries, also called techno-film. For these reasons, there is an incremental use of audiovisual sources by historians for the study of the twentieth century as these can be useful tools not only to better understand the history of industrial clients but also to deepen many aspects of twentieth-century society, which, otherwise, written sources alone could not fully explain (Frescani 2012).

In this sense, cinema is above all a historical source for the knowledge of the period in which it was produced (Brunetta, *Il cinema come storia* p.469). The public history that the company tells through the films helps to

understand not only the history of the company and industrial advertising but also enriches the history of cinema (Frescani 2019: 268). Furthermore, it is interesting to note that the rich film production concerning Gela (about forty between films, video-documentaries) is not only a source of history but also an agent of history (De Filippo 2016: 19) because it generates imaginaries and facilitates the process of their absorption in the community. The reasons for such an increasing production can be found in the fact that oil companies must not only face the problem of selling their products, but also consider various factors that can affect their commercial strategies: competition, opinion public, the world of consumers, the intellectual world and, in the case of a state-owned company, the relationship with the political class.

Mattei intends to make ENI a large modern company and a model to also be exported abroad, so the activity of film propaganda becomes an important element for institutional communication. Audiovisual communication becomes fundamental not only for the dissemination of products but also for defending the company's economic policy.

In particular, documentaries made from 1950 on, were initially teaching aids for internal use within the company, then as products to be introduced into the national cinema circuit. With the birth of the cinema office in 1958, entrusted to film critic Pasquale Ojetti, I began the systematic production of films of a certain quality, shot with the collaboration of numerous Italian and foreign directors for numerous techno-films. In the first half of the 1960s, the cinema office produced five documentaries on the discovery of oil in Sicily⁸⁷. Re-organized and systematized in the audiovisual fund of the ENI archive, these films have abandoned the didactic approach to give greater prominence to the message of the company, the objectives to be achieved and the strategic and political vision of Mattei's activities (Frescani 2019: 262), also in relation to the role that ENI was playing in the Mediterranean and European context (Frescani 2017). ENI's films are clearly oriented towards propaganda, reflect the dynamism of the company, and present industrial development as the only means of progress for the whole of society: methane and oil as indispensable sources for the civil and social growth of the population (Frescani 2016).

⁸⁷ It is worth noting that the tale about Gela and its modernization is somehow "genderized". Most of the time the story of Gela is narrated by men's voices (the voice-over of the video documentaries, the interviews to Enrico Mattei or other managers). This tale is not only told by men, but also mainly regard men. In fact, the process of modernization through industrialization occurred by means of the new job positions that were almost exclusively destined for men having a profession and expertise as engineers, specialized or simple worker. The industrial modernity has not meant for the women of Gela a working-driven empowerment process in respect to the original subaltern position in respect to the men, instead it has entailed a further feeling of exclusion from the progress. Women were only indirectly impacted by the arrival of modernity, and only by the increase of the income from husbands and male members of family that has implied the possibility to buy more "objects of happiness" for the house and the family. Only a few quantities of women had the chance to be involved into the plant's staff, most of the time as secretariats or cleaning ladies. This "gendered" narration and reality of Gela slightly changes in recent years, but it is still the prevalent one.

Among the main works it is worth mentioning "Italy is not a poor country" by Joris Ivens created in 1960 on commission from the National Hydrocarbons Authority. Ivens's work is a historical documentary that shows a country that is on the way to becoming modern from an industrial point of view, but that development has different speeds depending on the geographical areas. The intent of the film's authors and clients is to show how modern industry can bring improvements to the living conditions of the southerners (Frescani 2012: 98-99). The film is organized in three episodes, one of which, entitled "Appointment in Gela", is a 35-minute film by the brothers Paolo and Vittorio Taviani entirely dedicated to Gela. This documentary tells of the marriage between a worker from Piacenza and a girl from Gela, a real and symbolic union made possible by the discovery of oil in the sea, an excerpt from the voice-over states "southerners were the most unfortunate among the Italians and now luck begins to smile on them", luck, of course, is the discovery of black gold.

With a cut much less linked to social denunciation is "the Giant of Gela" (1960) which mainly tells the technical aspects of the discovery of oil and the construction of the plant. It is an almost futuristic eulogy of technological advancement.

Another film worth mentioning is "Gela 1959: Pozzi a Mare" (1960) by Vittorio De Seta and Franco Dodi which narrates the discovery of oil and the news that this event brings to the island, not only subtly economic but also as a social profile. The voice-over comments that "thanks to special requalification courses instituted by ENI, Sicilian workers today are transformed from farmers to skilled workers". In the light of these comments, it can be understood how easy it was for the viewer of the time to take sides with the company as they concretely saw the improvements brought by industry in the backward areas to make Sicily "reborn" on the screen.

A similar story can be found in the film published in the same year "Something new in Gela" (1960) by Fernando Cerchio in which there is a sequence of shots inside an extremely poor peasant house accompanied by a voice-over that tries to highlight the contrast between the old and the new with words such as "Ancient Gela, where time stood still and nothing seemed to change, tomorrow will be a modern industrial center" to mean that oil is the future of Sicily. This almost Manichean tale of the history and reality of Gela permeates not only the contents, the filming, and the music but also the titles, as for example in the techno-film entitled "Gela Antica e Nuova" (1964) by Giuseppe Ferrara which opens with almost "tourist" images: the sea, the archaeological remains, the ancient walls. It then shows the onshore oil yards and the marine well, where the offshore platform operates, which the voice-over identifies as "symbols of a clear break with the past". The images show in parallel, daily life in Gela and the construction work of the plant, thus contrasting the stillness of city life with the dynamism of modern industry. In the story there is also the feast of St. Joseph: a traditional rite during which the poor disguise themselves as saints to ask for charity, this to highlight, once again, how oil is transforming the Sicilians, even if alongside the novelties, ancient traditions coexist which at times seem too backward. Finally, another video-documentary worth mentioning is "De Palma a Gela" by Gilbert Bovay (1965) characterized, also in this case, by a montage that plays on the visual parallels between before and after

the arrival of the ENI. The film tells of Palma di Montechiaro, a center about fifty kilometers from Gela, which shows poverty, unemployment and backwardness precisely because there is no industry.

In the light of these excerpts, some comments may be made.

This narrative, merging several narrative tools, from comedian sketches to video documentaries, from magazines to newspapers, is toxic because it contaminates the public discourse with a simplistic vision centered on the dichotomy progress-industry-wellbeing vs backwardness-rural-misery, as for instance:

"We do not want to talk about industrialization in messianic tones: but we should want to close our eyes to the evidence to deny that giving the possibility of acquiring well-being by working is the highest and noblest form of sociality" (Mondini 1964: 15).

The common thread is that well-being, understood as the result of industrialized modernity, was contrasted with an image of the local population as backward and to be expiated through the industrial miracle, as the following passage further corroborates: "Personally, I believe I have never had, as I had in Gela, a cruder revelation of Sicilian poverty, of misery (...). Misery descended within us, became a sin of origin and a mirror of destiny; inalienable and irredeemable in you as in that painful and astonishing humanity (...) today it can be said that no trace of it survives (...) the increase in incomes is continuous and safe, access to consumer goods has increased (Sciascia 1964: 19).

The famous Sicilian literature writer, in line with many other intellectuals of that time, entirely embraced the idea of redemption through industrialization at the cost of referring to simplistic stereotypes on the stagnation of Sicilian society. A similar exaggerated picture of an unbelievable underdeveloped Sicily can be found in other movies:

"The Sicilian South that still believes in amulets, often more Arab than Norman, now has the opportunity to get out of immobility, to grow. A leap forward of many centuries, in less than three years. This is what is happening here in Gela" (Bovay 1965: 09'48").

The common thread between all these documentaries is that they try to show how the industrialization of the country was the only way to get out of poverty and move towards a bright future. In short, the future will be better but only thanks to oil! Or rather, as the voice over says:

"A future full of hope opens today for Gela, and has a name: oil!" (Cerchio 1960: 1'26")

They present the work of industry as a factor of modernity and development in stark contrast to a still peasant, backward reality, where situations at the limits of the civilian population survive that confirm the redemption

possible only through industrialization. The flourishing future is coming thanks to the industry is also in the account of the following excerpt:

"The Sicilian oilmen who work on the Scarabeo, unlike their fathers, who were forced to go looking for bread abroad, found work and civil dignity on their own island. But that is not all! They are aware that their toil and their sacrifice lay the foundations for the industrial transformation, for the economic and social rebirth of their land. After centuries of isolation, abandonment, inactivity, the dawn of a new day is dawning on Sicily. For this reason, the history of oil in Gela, if it has only just begun, has already taken on the epic characteristics and contours of the legend" (Dodi and De Seta 1960: 24'33'').

"These workers and these technicians have the same pride in participating in the construction of a highly technical company. The same awareness of making a decisive contribution to the economic rebirth of a still depressed area" (Dodi and De Seta 1960: 6'12'').

The directors of this documentary describe the industry with confident terms for the future. They also describe industrial buildings with a futurist language presenting them as products of modern engineering, without making any reference to the fact that these are structures that radically change the environmental landscape. This helps to understand the climate of the time more immediately, restoring the contemporary gaze that accepted that image of the changes in question without questioning their environmental impact. This further passage is an example:

"Before, here there was only a millennia-old silence, an immobility made of resignation. Then suddenly (...) the landscape itself began to transform. The aluminum and steel towers altered the appearance of traditional Sicily" (Dodi e De seta 1960: 10'31'').

The praise of well-being is actually concretized through praise of consumerism and objects of happiness, as opposed to the description of a miserable and wild Gela "the superfluous takes its place in a world that was previously severely conditioned to anxious research than necessary. The television, the refrigerator, the things that are comfortable or embellish the houses and life begin to exist even among these people (...) The frontier of industrial civilization, finally moved to the South, has taken it away from the grim work of the countryside. From his work a city of concrete, steel and glass will rise" (Gela antica e nuova, 1964: 8'25").

All "objects of happiness" which highlight how there is a "hungry hope" (De Filippo 2016) which converts into secondary issues all those problems that the industry has caused. Furthermore, these films also have a certain sociological and anthropological value, in fact they do an extensive use of interviews and portraits. The economic and social redemption of the Sicilians is in fact at the basis of the narrative built by ENI and finds its foundation precisely in the interviews of the workers, who during the years of the construction of the petrochemical plant and the start of the activities have experienced Enrico Mattei's dream firsthand. The interviews with the workers give a human dimension to the rapid (and inhuman) industrialization process

underway and transmit to the audience truthfulness. Such poetics of modernization with a human face (De Filippo 2016: 72) aims to highlight how progress has brought new benefits to the population: now the laborers can buy a motorbike and their children are no longer forced to emigrate, but they are able to plan their future on site. Indeed, these narratives not only never make any reference to any ecological concern - a relatively understandable absence given the historical context - but they do not go deeply into the discrepancy between technological progress and social development at the basis of Gela's risk landscapes.

Far be it from me a simplifying and conspiratorial approach, it seems fair to point out how, in the face of a collective toxic narrative acted on at various levels by private-public and para-public subjects in the first decades of life, the narrative has taken on a different trend from the 1970s onward due to local and global social dynamics. In fact, the limits of a community emerge that almost completely rely on the presence of a large company which, as we have seen in Gela, has nevertheless started a process of gradual reduction and dismantling of its presence, as these newspaper articles highlight.

"The oil does not bring any wellbeing: the industry and the town are two strangers" (Rosso, *La Stampa*, 27 April 1967)

"Two of the four workers that were involved in the fire at ANIC plant have died" (Parlagreco, *Giornale di Sicilia*, 24 April 1974)

"On alert the entire Sicily: does ANIC want to leave Gela? 1600 layoffs are planned" (A.R., *La Stampa*, 15 January 1977)

"The mirage of the oil. Agip Mineraria from 1943 to 1973 has drilled 2284 oil wells. 70 oilfields -that, are however quite small- have been so far found out in total (Lugli, *La Stampa*, 24 May 1974)

During the '70 until the 80s' it became clear that the company was not interested in doing further investments neither in enlarging the production nor diversifying it. In addition to this, several job-safe-issues arose after a series of dangerous if not mortal incidents. The trust in the industry does not vacillate only for work related uncertainties, but also because it gradually increases the sensibility of the population about the environmental risk due to industrial pollution. This new delayed awareness emerged in Gela compared to global trends and has at least two different motives. One reason is the effects of the environmentalism movements that have animated the international debate from the 60s, then becoming more institutionalized through the metabolism of the ecological concepts into a series of intergovernmental panels and protocols. Another reason is much more connected with the Italian contexts and regards the new sensibility and worry after the Seveso accident that unveiled the dark side of progress. The combination of these factors mirrored also in the break of the monolithic narrative that, instead, takes on other nuances of environmental denunciation, or at least, uncertainty, as some newspapers write:

“For 18 years, the town has blindly accepted [the presence of industry]. On one side technical faults, on the other side the job. A dilemma for Gela that brings anxiety. The director and deputy of the "petrochemical" have been sent for trial. Both, already suspected of a crime, are accused of violating the Merli law" (Infurna, *Giornale di Sicilia*, 1979).

The oil spills, once considered normal as a part of the industrial routines, came to be called into question and feared.

“The Ragusa coast has changed color. The black wave has arrived. Seagulls no longer fly. Tons of bitumen poured onto the beaches and coasts of Scoglitti. More than a hundred men with bulldozers try to limit the damage, which is considerable" (Casagni, *Il Giornale di Sicilia*, 12 December 1980)

It is also interesting noting that this new awareness has been gradual over the decades, they have not been a sudden disclosure, in fact some newspapers still contain some contradictory messages

“Despite the refineries and industries, the sea of Sicily is not polluted” (Rovidà, *La Stampa* 21 August 1979)

“The hope [for Sicily is called] Industry” (Pepi, *Giornale di Sicilia*, 12 December 1980)

In the light of these quotations coming from the press reviews, it can be seen that the toxic and monolithic narrative that has impregnated the first twenty years of the life of the plant gradually faltered, and the first cracks appear in it once the clash with the real effects of the industry are undeniable. However, the narratives will mainly keep ignoring the health and environmental issues for many more years or give them only minor attention.

During the 80s and 90s most of the public discourse about Gela regarded its illegality both in terms of urban development and in terms of the bloody mafia war. The frequent gun fights, violent murders, racket threats and information about the spread of corruption overshadowed any other issues and struggles in the community until the end of the '90, while the definitive closure of some sectors of the plant occurred. Newspapers talk about Gela as the city of illegality as well as the city of unemployment and job issues, but no space is given to all those insurgent forms of critical thoughts, movements and practices.

In the nineties there was a real short-circuit between the social forces as the “narrative landscape of Gela” became more and more polarized. According to Alessandro De Filippo (2016: 179-180) on the one hand there is hard and pure environmentalism, which denounces scandals and draws plots and imminent disasters, on the other there are the reassuring annual sustainability plans rich in data and survey tranquilizers.

In particular I want to focus on two moments in the story of Gela in which the clash between the industrial dream and the stark reality occurs, the pet-coke revolt and the bio-refinery conversion⁸⁸. In both cases, in the face of some real tangible facts and of a misleading narrative, the re-actions have been different.

As for the "pet-coke revolt", it was a consequence of the temporary closure of the refinery by the prosecutor following several reports and complaints from environmentalists. What emerged was that the refinery was emitting pet-coke on a daily basis, which is a highly harmful and carcinogenic substance prohibited by Italian law. This closure triggered opposition from all the citizens and workers of Gela who for weeks took to the streets blocking the streets and using the "better to die of cancer than starvation" motion. This event, which in the light of modern ecological sensitivity would be considered shocking, found instead a lot of space and adhesion in public opinion also thanks to a high and strategically biased media coverage. As examined by Alessandra Emanuela Cascino (2009), the environmental information in the pet-coke affair has maintained a biased alignment by keeping the interests of the petrochemical industry in greater light and taking into little account the perspective of the local population (Cascino 2009: 16). Through an analysis of the journalistic articles produced by the newspapers, in the central period of the revolt, Cascino 42 notes how the narratives can take on a different tone but always justify the priority of work.

The conflict between work requirements and ecological sensitivity continued to conflict even in the following years. The ecological narrative becomes radicalized and takes precedence over the industrial dream narrative. What remains for the company, which has now become private as well as one of the global majors, is to apply greenwashing strategies that are nothing more than toxic narrative forms that use the "green" label to cover old and new inequalities. As highlighted by Maura Peca and Andrea Turco (2020) there is so much green in all the extractive activities that are still carried out by ENI. In the face of a declared intention to move toward renewable energy, the true core business of ENI is still oil and gas production, having a huge environmental and climate impact. The so much publicized green experimental solutions aiming to put in practice the circular economy principle, such as the guayule fields into the plant, have actually been a failure. More in general, all the publicity about the reconversion into a green-refinery is still more a wish than a reality.

In addition to this new and green propaganda approach, ENI also mobilizes other cultural diversions. Among these strategies for embellishing public spaces through the involvement of external and nationally renowned artists is the creation of a site that aims to enhance the beauty of Gela. This site is part of a larger project called "The roots of the future" which collects another story of Gela. Among the narrative tools tested, the use of the documentary web series is relevant, which, through the first-person story of some inhabitants or figures recognized in the context of Gela, gives voice to a perspective of the landscapes of Gela. This web series, now in six episodes, presents elements of novelty in terms of both content and style. Its only flaw is that it is produced and sponsored by ENI which is why it is inevitable to eliminate a minimum of suspicion towards it.

⁸⁸ Anna Paola Di Risio has dedicated several articles and its Ph.D. to the topic of the conflictual narrative on Gela (Di Risio 2012a, 2012b, 2013).

Final remarks

In this chapter, I tried to unfold the story of Gela from the view of the mainstream narrative coming from the press review of some historic newspapers, both national and local ones, but also from the communication media put in play by ENI over its more than sixty years of presence in Gela. I have pointed out that between the 50s and 70s it can be recognized as a “mainstream narrative” that mostly found that everyone agrees. Consistently with a national strategy enforced by the State, ENI pushed and divulged an official tale of the story of Gela by mobilizing all media tools available at that time. The account coming out from them depicts Gela as a place without dignity and development, while sustaining that only modernization by means of industrialization may allow it to achieve well-being. This narrative occupies the public discourse without leaving any room for other possible interpretations of the facts. By diverting the attention from the real changes, this narrative of (in)justice has intoxicated the collective mindset, corrupting the ability to discern the dynamics of exclusion and injustice that, actually, were increasing due to the settlement of the industrial plant. Similar to the Pygmalion syndrome, by dint of telling and retelling the same narrative sermon, anyone persuaded themselves of it. In fact, by tracing back the mainstream history of Gela, it seems that no one did doubt this recounted tale that was already turned into reality, more in the collective imaginaries rather than in the actual daily life. To erase any shadow of doubt about the petrochemical industry in Sicily was precisely the emphasis of the narrative, the enthusiasm that accompanied it since its origin, and the economic and social unease of departure. If such a mainstream tale may be found, justification in the fact that really those were the years in which the State-driven industrial development really seemed to be the ideal solution for contemporaries to solve the economic problems of the country and, in particular, one of the roads for the solution of the southern question, later on, such a situation changed. Collective perceptions started to change since the 70s, when both the reduction of job opportunities inside the ENI plant and the gradual and shy increase of environmental awareness have generated a slow and uneasy process of liberation from the dream of progress through massive and top-down industrialization.

However, ENI, which from the ‘90s was converted into a joint-stock company, has not at all attenuated nor re-modulated its official narrative, rather it has further empathized its communication strategies in order to face the emerging attacks and polemics coming from a more and more disillusioned public. In particular, I gave the example of the media that have been mobilized during the pet-coke event and the more recent use of communicative diversions that use story, culture, sport, etc. themes as a way to distract the public from the core problems.

In short, although this “domestication of memory” (Armiero 2021: 20) still has effects on “late-industrial landscapes” of Gela (Benadusi et al. 2021), the effects on its economy have mainly been those of initiating an inflationary process and distortion of consumption, compromising the traditional agriculture and causing a “hypertrophic growth of the city beyond any rational recovery plan” (Pozzi 2008: 330).

Over the years, it became clear that the ENI petrochemical factory did not bring to Gela all the fantastic promises regarding job opportunities, security, and justice. On the contrary, the refinery brought contamination

to Gela, which entered into both the environmental matrices and the bodies of humans and non-humans, permeating the daily life of people beyond individual overt diseases. However, this story is not told, nor by this narrative, nor by the quantitative and epidemiological data, nor by the story of planning policies of Gela. In order to get to know such an alternative story, a small slow street approach is needed, which I will unfold in the next chapter.

Building on this rich production of expert knowledge, both medical and sociological, and on the mainstream planning, I intend to explore another knowledge and another story of the risk landscapes of Gela in the next chapter.

3.4 An SSS account of the risk landscapes of Gela: another (hi)story, another narrative, another knowledge

This chapter seeks to unfold the result of an SSS approach in Gela. It will disclose another tale of the risk landscapes of Gela through the perspectives of the experiences that are embedded into the human and more-than-human communities. It aims to demonstrate that the collection of small data allows us to deconstruct the toxic narrative and mainstream history of Gela, while spawning alternatives and complementary ones in respect to those that already exist. Finally, it will reveal all those forms of insurgent knowledge and practices that are already present and shaping the landscapes of Gela.

Preamble of a Systematic Exclusion from Stages in Local History

On July 4, 2019 a crucial event for the future of Gela occurred. Inside the skene⁸⁹ of Palazzo d'Orleans - the headquarters of the Sicilian Regional Government-, the president of Sicilian government, the regional minister for the productive activities, the mayor of Gela and the managers of ENI i.e., the multinational company owning the Gela petrochemical plant, discussed some clauses of the Memorandum of Understanding for the territory of Gela (2014) and celebrated the launch of the new green-high-technological machinery for the refinery. In this key-meeting - advertised in all local newspapers - everybody was present. Or perhaps not. Indeed, a few were missing from the powerful choreography planned by the political and economic elites: for instance, the women of Gela who suffered miscarriages, the relatives of the numerous people who died because of cancer, and all the unemployed citizens who got fired when the refinery began a policy of gradual reduction of the production.

In brief, the representatives from grassroots organizations were absent, or better, not invited. After all, this inattention is coherent with the corroborated praxis of exclusion of citizens from the decision-making process, a praxis that has deeply influenced socio-cultural structures, reducing the local communities to a subaltern group. This explains why, not only the community was not invited into the palace where the decisions were taken, but also why no one was protesting outside that palace. Framing the event in terms of a clash positioning powerful elites vs. local community is also misleading because it assumes the existence of a homogenous community, not one which is fragmented and far from being a subject with collective capabilities (Robeyns 2017). According to Pierpaolo Mudu (2009: 13), in Gela both the local community and authorities have internalized the Foucauldian concept of eco-governmentality assimilating the typical ethic of capitalism, centered on production, individualism, and profit. Likewise, the sociologist Pietro Saitta (2009) describes Gela as a marginalized place in which the environmental degradation interplays with psychological and cultural

⁸⁹ In Ancient Greece, the skene was the structure at the back of the stage of theatre where the classical *drama* occurred.

deprivation resulting in the spread of illegality (Becucci 2004; Ciccarello and Nebiolo 2007), distrust, and lack of a mature and transparent democracy. Hitherto Gela may seem to resemble what John Gaventa (1980) defined as a "powerless community", i.e. a community that instead of feeling a sense of outrage, displays apathy and no reaction. However, this is not exactly the case. The citizens of Gela have to face several challenges: to unhinge the mainstream narrative that minimizes the damage to the environment and their health; to provide a direct causal nexus between exposure to pollutants and health issues; to struggle in order to have guaranteed basic needs such as clean air and water. What is lacking is not the community's responses, but rather an attentive analysis of how these responses have (or have not) touched the management, evaluation, and mitigation of risk and the planning of Gela over time.

Toward a Situated Knowledge in Gela

When I started to look at Gela, it seemed to be an extreme case that would have allowed me to deepen my knowledge of a territory (the Gelese one) in which ecological issues are viscerally intertwined with the controversial transformations of the local cultural, social and economic fabric and to frame them with respect to wider systemic issues and structural, from the past to the present to the future. Furthermore, the contaminated landscapes of Gela seemed to me an ideal context both to reflect on forms of violence and disaster stratified in time and space, and to think about the visions of possible futures that emerged from the places of late industrial modernization in Sicily.

A moment that proved particularly useful for a first situated understanding of the complex issues on which I had decided to work was the public presentation in Catania of the book *La città a sei zampe su Gela* (Turco 2019), during which - together with 'author - sociologists, anthropologists, historians, economists and trade unionists discussed the gaps and opportunities of the green reconversion of the plant. If on the one hand the trade unionist present at the meeting stated that he could not "spit into the dish he had eaten for years", as the petrochemical body had brought progress to Gela, and if ENI had not been in Gela, "At this time we were still with the shotgun and the flat cap"⁹⁰; on the other hand, the activist and journalist author of the book tried to denounce years of pollution and political corruption. In short, the collision of divergent visions on the history of the territory was evident and also emerged as the aftermath of industrialist rhetoric, far from being insignificant, were still the subject of contention over concrete imaginaries and policies, past, present and future. It thus became clear that Gela could actually represent a suitable place to put into practice the type of approach I had in mind, based on a non-detached and neutral contamination between different disciplines and knowledge.

With some appointments on the agenda, I then returned to Gela for a series of visits and stays, but this time as a scholar/researcher who she intended to reflect, together with the people I had come to know in the meantime,

⁹⁰ This is an excerpt from notes taken by myself during the aforesaid conversation around the presentation of the book.

on issues related to the forms and practices of living in that territory. From the very beginning, I was struck by the reactions (external and internal) expressed towards the territorial choice I had made. The first, the external reactions, revealed impressions of disbelief, surprise and irony: “With all possible places to work, why Gela?”, “Gela? A horrible place!”, “Be careful!”, “Don't get sick”, “What are you going to do in a remote and chaotic place like that?”. Phrases spoken by people who, at times, had never seen the town, confirming how the imaginaries of Sicilians are often pervaded by stereotypes and prejudices. To external preconceptions, however, others were added that came from within and from some citizens of Gela in particular. In fact, my presence did not go unnoticed, because it evidently touched sensitive and contradictory points of the existential condition of the people I interacted with, arousing curiosity, embarrassment, some form of hostility, and skepticism from time to time. If, on the one hand, the fact of being Sicilian seemed to open some doors for me and allow me to gain a certain understanding and trust among the locals, on the other, being a young researcher and woman who moved independently in the territory was not always appreciated, probably due to a residual patriarchal vision and a tendency to codify relationships based on gender markers. More frequently, I was considered as yet another outsider, intending to use the "Gela case" for some scoop or scientific publication (on malformations or industrial contamination, it didn't matter). The mistrust, albeit hidden, transpired from the proxemics and, from my point of view, told of a territory that for decades had been prey to different forms of "extractivism"⁹¹, not only economic and material but also scientific and academic (Privitera 2021a). I have often had the impression that, in Gela, citizens had been considered and/or had ended up considering themselves as 'laboratory guinea pigs', indicators of bio-accumulation of harmful substances to be used for social, economic, epidemiological studies of which they did not always grasp the meaning or the usefulness of everyday problems (first of all connected to employment prospects and health conditions). What has been said pushed me to reconsider the ethical posture in the field and to point out, first of all with myself, how the

⁹¹ As I have argued in a recent publication by me (Privitera 2021a), the scientific literature refers to at least three forms of extractivism: a literal extractivism, an extractivism understood as a model of society, and extractivism of knowledge. The first touches and alters the metabolic cycles underlying the human-ecosystem relationship and consists in the physical and systematic subtraction of resources at the hands of private, state and financial interests to the detriment of local communities and the environment on which they depend. The second interprets extractivism as a model of society (Zibechi 2016) in which all the processes of expropriation and ecosystemic and social devastation are part of the accumulation mechanism for dispossession typical of financial capital (Harvey 2004). In this case, extractivism, conceived as the indispensable piece to guarantee the constant economic growth required by today's dominant global capitalism, can be effectively summarized in the syllogism "without growth capital does not accumulate, to grow it is necessary to extract, therefore it is extracted", "Without extracting capital does not accumulate, you do not get rich, and you do not grow". The third touches on the epistemological and methodological aspects with which both hard and soft sciences build knowledge in an extractive way, that is, considering petrochemical cities, mining areas or areas destined for massive infrastructures as "laboratory cases" to be probed, analyzed in depth for extrapolate the functional data for the success of one's fieldwork, without setting the goal of creating spaces for authentic dialogue and osmosis between knowledge.

purpose of collecting small data should be to transform them into collective and shared knowledge, with the explicit desire to contribute to transforming and innovating the social, environmental, and productive fabric of the area. The very phase of listening, interaction and engagement, could represent that "threshold space" between the territory and the academy to be inhabited in order to implement the third mission⁹² of the university (Cognetti 2013). In line with the initial empirical curiosity that I had nurtured, my positioning aimed not at a mere observation and flat description of reality, but at a deep understanding of it aimed at action.

Understanding the field as a place created by the actors through their relationships, and in particular through actions aimed at affirming and opposing positions of domination and subordination, of the vanguard and rearguard, inscribed in local history, at least had the consequence of changing my way of understanding the field and of interpreting the history of the petrochemical plant in its relationship with the opposing and proactive forms that arose in the territory, and therefore of paying attention to the practices of resistance and planning aimed at rebalancing the power differentials. This heuristic-social stability of the research allowed me, among other things, to come into contact with figures who had a history of resistance behind them (Saitta and Pellizzoni 2009)⁹³ and with the bearers of alternative proposals who, aware of the problems of the city, at that stage were experimenting with different ways to improve their living conditions and reconstitute a social fabric that was more consistent with what they consider a "healthy" socio-economic development.

Another (Hi)story, Another Embodied Knowledge of the Risk Landscapes of Gela

My exploration of Gela and of the human-more-than human dimension of knowledge, was expressed above all in informal ways and places: in front of coffees consumed in bars; during various walks and "peripatetic or walking interviews" in parts of the territory considered emblematic from the perspective of those who led me; or during outreach visits, carried out directly at people's workplaces or homes, or where the events that were the subject of the conversation were taking place or had occurred.

Through this immersive fieldwork I had the chance to understand how behind the smokescreen blessing the industrial progress, a gradual and silent process of pauperization and despoliation of the basic territorial resources have occurred silently over time making them always more "contested" (Di Risio 2012b). Emblematic among these is the long-standing water question. Being that Gela is located in one of the less rainy zones of Europe, it had to valorize as much as possible all the natural water resources already present in its plain -that are mainly the Gela river and its tributaries- since ancient times. The Gela River was so important in the history and life of the communities that it was considered a deity during the period of the Greek polis

⁹² See note n.14.

⁹³ The term resistant is to be understood in a broad sense: "a man who says no. But if he refuses, he does not give up: he is also a man who says yes" (Camus 2013: 43), because "No is not enough" (Klein 2017) (Sic! They use "man" and "he"!).

Geloa. Moreover, it was one of the main routes of penetration into the interior of Sicily for prehistoric and Greek populations, as it was navigable at that time. Until the first decades of the twentieth century, its mouth was a "port-canal" and a natural refuge for the boats of the local fishing fleet. It was also a source of survival because of its fish and also for hygiene as it represented the "wash house" in which to wash clothes, and finally a source of life for the farmers who, in periods of drought, went to fill the "quarare" to irrigate the cotton and wheat fields. At the gate of the '50s, the system for distribution of water was undeniably obsolete. Needless to say, both the construction, activation, and routine activities of one of the biggest petrochemical plants of Europe, would have been impossible to realize with such an outdated water system. In order to cool down and activate all the machinery and to feed the thermoelectric power plant to make the plant function, a huge daily water provision had to be guaranteed. Consequently, a series of infrastructures were built, such as a system of dams, channels, and desalinators. The fulfillment of the needed amount of water was achieved through a infrastructuring made of dams and new channel networks, highly impacting the landscapes of the plain, but, above all, affecting the social equity. These new infrastructures were funded by the "Cassa del Mezzogiorno"⁹⁴ provoking a further centralization of the power in the hands of a few construction companies and therefore becoming one of the privileged targets for mafia interest (Ciccarello and Nebiolo 2007; Becucci 2004). Notably, around 20 million liters of drinkable groundwater reach "u stabilimentu" through a 40km aqueduct from the Dirillo river, although citizens do not receive the same treatment. Whilst the population relies upon discontinuous supplies of water, the refinery must have its water needs for quality and quantity satisfied. As an aged man from Gela told us:

"I remember when I was a child there were several public fountains in the city. In the past, people did not have water in their houses, so they just used to take water directly from the public fountains. Then, with progress, all people got a running water system in their homes and public fountains gradually disappeared. Nevertheless, in the last decades, the problems with water have increased and we often do not get running water or we must follow some strict limits even if the plain of Gela is potentially rich in streams (...) So now we have access neither to public nor to private water" (I 5⁹⁵, January 2019).

The inhabitants equip themselves with large cisterns, on the roofs or underground and, in some cases, with pumps that illegally attach themselves to the water pipes, to independently draw as much water as possible. In addition to the discontinuation being unjust, the water supply is also geographically unfair. It should be noted

⁹⁴ The Cassa del Mezzogiorno (English: Fund for the South) was a public effort by the government of Italy to stimulate economic growth and development in the less developed Southern Italy (also known as the Mezzogiorno). It was established in 1950 primarily to encourage the development of public works and infrastructure (roads, bridges, hydroelectric and irrigation) projects, and to provide credit subsidies and tax advantages to promote investments. It was dissolved in 1984, although its mandate was maintained by successive, less centralized institutions (source: Wikipedia).

⁹⁵ I will indicate the interviewee with "I", the focus groups with "FG", finally the walking interview with "WT" plus the number according to table 2.

that in the period from 1963 to the 1990s, 50% of the groundwater brought into the city by the aqueduct was not used for industrial purposes but for civil purposes. However, not for any "civil society", but was distributed only to the inhabitants of the Macchitella Village who were mostly ENI employees. This confirms that instead of being a right for all and a common good unifying the community, it instead became a further element to sharpen social and spatial injustices within the context of Gela. Therefore, the industrial-driven water management not only damaged the relationship, with the groundwater as common goods, but it has also increased the divides inside the community of Gela causing further social fragmentation between privileged and unprivileged people. As maintained by Farhana Sultana (2018), the uneven distribution of water and the unequal access to the limited amounts of safe water that exist are indeed the lens through which to understand and appreciate complex social and environmental issues. Water injustice can be viewed as a cross-cutting multi-sectoral entity that connects across categories symbolizing a holistic unfair situation that does not regard only a matter of quantity (industrial continuous water supplies Vs civil socially discontinuous water supplies) but also of quality. In fact, around the middle of the '70s by using funds from the Cassa del Mezzogiorno, a desalinator was built by the workforce of the plant. The desalinator gets its water precisely at the mouth of the jetty used by oil tanker ships, where very likely some toxic matters, such as mercury and others, may spill. But this is not all. In order to make it potable, the water undergoes a potent process to convert it into a water devoid of any minerals and nutrients (Saitta and Pellizzoni 2009: 170). The situation is even worsened by the deplorable conditions of the still old pipes which most of the time when water comes from people's tap, it is dirty and anything but transparent. It is not by chance that this water has been paradoxically defined as "potable but not drinkable". All the perceptible uncertainties generate a permanent state of anxiety and stress, as the following testimony confirms:

"Here the situation is extreme. No one would risk drinking water from the tap! (...) All we do is buy bottled water all the time" (I 9, January 2019).

Interestingly, during my period in Gela, being myself Sicilian and quite familiar with the scarcity of water, I was not surprised by its low pressure from the tap, also, by already knowing that it was not safe I was not drinking it, however, the feeling of distrust and fear is much bigger, as a psychologist volunteering with people affected by tumors told me once I shared with her the way I was cooking most of the time for myself:

"What are you doing? This is very dangerous. Absolutely stop using the water from the faucet, even if you boil it. This may not be enough to purify it. You will never know how safe this water is. Everything you are going to drink or eat, including pasta, coffee, or tea, you should cook with the water from the bottles. Personally, I use the water from the tap just for washing myself and cleaning the house. And sometimes, when the water is patently dirty, I don't use it even for this. It can happen that I wash my teeth by using bottled water" (Private conversation, October 2020).

This autobiographical piece reveals that water injustice is not only a matter of quantitative unequal provisions but also qualitative. Citizens of Gela are considered as more "expendable" (Pellow 2016, 2018) than the

industry itself, so they hold fewer water rights. The normalization of people's penury conditions has led to enduring with quiescence what somewhere else would not be conceived as acceptable. There were barely any attempts to convert this dramatic coexistence with water shortage into a collective request, and only when the situation worsened even more than the already awful one. An example comes from the mobilization of a popular petition to raise awareness and ask for an increase in the supply of water to some streets located in the historic center. Led by the Marisa Bevilacqua, housewife and activist who -how I explain later in this chapter, also plays a controversial role with regard to other issues in Gela-, registered the petition at city hall and diffused it in the local newspaper where it was published together with a letter addressed to two mayoral candidates in 2015:

“The water is supplied for only a period of time equal to two/three hours every two days. This situation of non-compliant with part of the bodies responsible for managing the water system in the city of Gela has persisted for over a year and, therefore, cannot be considered an exceptional event. It is evident that the aforementioned non-compliance causes enormous problems of a sanitary nature to the people residing on the aforementioned streets, among other things with imaginable consequences, with the arrival of summer (...). A few weeks ago, there was a small increase of a few hours, but subsequently, the water supply returned to the usual two / three hours every two days (...). Ours is a small request, we simply ask that the water supply from the current 3 hours be increased to at least 8 hours as is the case on the other routes that are part of the downtown area.” (Marisa Bevilacqua, *Accento News*, June 10, 2015)⁹⁶.

As these wasted relationships are grounded in water injustice, it is an insult to injury that the water supply in Gela is managed by the private society s.p.a Caltaqua. Being a not-local Italian-Spanish company and being a monopoly for providing water service in the entire area, it has a certain power to establish the amount to be paid, which is incredibly higher than the average for Sicily, while it is distant from the local problems. In 2019, after countless water supply interruptions, there was a second wave of mobilization, also in this case channeled towards bureaucratic modalities. In particular, Konsumer association, through the city coordinator's lawyer Stefano Scepi, collected the requests of the citizens and sent them via pec to the managers of the Caltaqua company asking them for a meeting to discuss the difficulties that afflict the people of Gela and related to the constant lack of the use of water, as well as the exorbitant costs that citizens are required to pay. Following a heated citizen debate and a continuous barrel discharge between the private company and the public administration, all municipalities whose systems were managed by Caltaqua got together and decided to form a control body aimed at assessing the work of the managing body and called it the "Territorial Assembly of Water". Despite that, on paper this assembly was to ensure controls on Caltaqua, but these have never been implemented or, in any case, have been far too mild. In fact, 2020 was characterized by a further increase in bills which reached astonishing amounts between 700 and 7000 euros per quarter, compared to an average of

⁹⁶ <https://www.accentonews.it/fondo-iozza-erogazione-acqua-al-minimo-lettera-ai-due-candidati-sindaco/?territorio=gela>

400 euros per year in other Sicilian cities. Despite some water infrastructures having been fixed since then, the water question is still an unresolved problem, as the following declaration by the current mayor of Gela seems to further validate:

“Even if the service has improved, it still continues today and too often creates problems, inconveniences, long interruptions, losses on the water network, and then comes a bill that becomes increasingly high, and with the current economic crisis many families rightly complain about the excessive cost of the water that they can no longer bear.” (Lucio Greco, Video Regione, November 15, 2021).

On the 30th of November 2021, news in the local newspaper tells of an entire neighborhood in the historic center without any water for eight days. Inhabited by families with children and old people, the protest of residents has not yet received any feedback from the private company. The uncertainties linked to water injustices are concretized not only in the management, distribution, and provision of “potable” water for home use but also for agricultural use. The water consumption in the plain amounts to approximately 30 million cubic meters per year used to irrigate the approximately 360 square kilometers of land used for such use (Presidential Decree 17 January 1995: Art.2.1). The main sources of irrigation are from the surface waters of the neighboring water basins that accumulated in four reservoirs: Disueri Dam along the Gela river; lake of Biviere; the Comunelli reservoir; and the Cimìa reservoir along the Cimìa river. Agriculture only minimally draws on groundwater -which, as I have already explained, is mainly used for the plant, supplemented by desalinated water. The lack of strategic importance recognized to the groundwater in the water supply of the area has led to limited attention to the problems of groundwater quality, the reason why there are no comprehensive and systematic studies of the quality level of groundwater. A similar lack of information can be found for surface water resources with the limited available data which highlights organic, urban, and zootechnical pollution phenomena. While the punctual damages connected to specific sources of contamination have been recognized and become the object of still ongoing remediation work, the potential diffused contamination into the agricultural production and food chain is still unknown and mostly unexplored. Such a lack of knowledge may be filled through some punctual studies carried out by independent researchers and graduate students and, above all, through all these forms of insurgent knowledge that are embodied into the stories of humans and more than human communities living on the Gela plain. An example of the first comes from the studies by the University of Messina (Granata et al. 2011; Salvo et al. 2018) that have observed high values of toxic substances (cadmium, arsenic, etc.) in local vegetables and in the samples of the aquifers crossing the plain of Gela.

The vagueness regarding the possible contamination of those fields compromises the agricultural development of the area, generating a bivalent attitude toward this topic. According to the most recent analysis of the soil of the plain of Gela (Salvo et al. 2018: 118), the land close to the refinery contains a concentration of arsenic, lead, and nickel which is higher than the limits established by national law (Legislative Decree 152/06). Those values are safe neither for human consumption nor for agriculture but have been applied on some specific

samples, leaving room for doubt with regard to all the rest of the plain. This smokescreen, made of mistrust and unsureness, entails that nowadays there is both a sort of stigma about products from Gela because of the well-known pollution and an ambiguous and "schizophrenic" (Messina 2005) behavior by farmers since they acknowledge such contamination unevenly. A farmer I met shared with me:

“Sometimes it is better not to write that the products are from Gela, otherwise, the traders try to pay less for your products (...) still now the fruits and vegetables we produce are perfect” (I12-WI 2, January 2019).

Another farmer, while I was petitioning him about the contamination of environmental matrix, including the plants, with a defensive behavior told me:

“What pollution? The pollution I remember was at the time of petcoke, it was thin dust that sometimes I found covering my oranges. But now there is no more petcoke (...). The plants may not absorb the toxic matter, rather some of them may be able to decontaminate the soil from toxic matter (...) The point is that we cannot know it exactly” (I 17, September 2020).

The same farmer, however, states to be firmly against any type of pesticide:

“Six years ago I had a health problem, I had cancer and I had to retire early (...) so what do I do? loitering around doesn't suit me, so I started the family garden, then, two years ago my son went to university, and I needed some extra money to round up (...) let's say that, for the damage to my health I had, it bothers me to use poisons (...) Even though I was an agro-technician (...) my origins are peasant, in fact when I was little, my dad used to take me to the countryside, and he introduced me to plants, medicinal plants, edible plants (...) after the tumor I tried to solve the problem by changing my diet, treating myself with herbs (...) now I have a healthy diet without any pesticides” (I 17, September 2020).

All these small data bring to light the extended and expert knowledge coming from the direct body experience of sickness but also the daily sense of living in contact with a toxic environment. They also point up a series of mismatches between expert knowledge and citizens' knowledge, baring bivalent behavior due to a weaved combination of mistrust, fear, and job precariousness. Those responses are not only a peculiarity of agricultural fields but are quite diffused and can be found also in the following accounts by a fisherman and by a resident of Gela:

“A few strange things have occurred (while we were navigating in the sea). For instance, in a few cases, we have found some fishes having strange moles of different colors, and then we understood that these were a kind of tumor (...) Other times some fishes are affected by something similar to *spida bifida* (...) What do we do in these cases? What we can do in these cases is just give back these fish to the sea (...) It is already difficult for fishermen to keep the wolf from the door. Imagine if we spread these types of information, we would not work anymore” (I 38, April 2021).

“When I come here to Licata, where my grandfather lives, we go to buy fish with him, and we always end up talking about Gela. We ask the fishmonger where the fish comes from (...) In short, we understand that fishermen go to the border del mare, between Licata and Gela, they fish there at the border, but they don't say it” (I 1, October 2020).

Such schizophrenic behavior is readable not only in the producers' accounts but also in consumers' accounts.

“Honestly? From the person who has the small local shop and sells you a bag of tomatoes and courgettes and tells you that they are organic, but he grows them privately in his garden, well, I don't go to this person to buy anything because he has the land near the industrial plant” (Gaetano, I 33, October 2020).

Other approaches are more fatalistic:

“I think we prefer to eat our foods, if any. After all, *“si nu pigghi dall'aria, u pigghi dalla terra, non n'hai via di scampu ca”*⁹⁷ (I 19, October 2020).

The same person underscores how the problems are not only connected with the potential presence of environmental contamination due to the industrial pressure over time, but it is also a cultural and social issue.

“It is said that the land (of the plain) is not so bad, the land around here does not seem to be all compromised, but I do not think it is just a factor of contamination (...) Let's put it this way, let's imagine that we are going to do some studies and real investigations (in the entire plain of Gela), and we discover that there are areas that are impassable (...), and maybe there will also be areas that we can recover, but the problem is "who do we give these lands to? " We have to build the base, that is the people (...). Aside from health concerns, the other issue (related to agricultural production) is that there is no capacity. Let's take the example of tomatoes (...) we certainly have tomatoes, we know them, we grow them, but we don't sponsor them properly, because growers don't join each other or join realities and cooperatives already existing ones such as Coldiretti, also because the local administration is not interested” (I 19, October 2020)

This tumultuous industrial development has hence affected not only the unjust freshwater management and distribution but also the productive activities, the land use and, consequently, the structure of the agro-natural landscapes that have gradually and inexorably changed over time. A middle-aged woman reported to me:

“Many families in Gela, including mine, own extensive lands in the plain (...). In the past, people used the fields for agriculture, either for the market or for personal consumption. Nowadays, few people farm the land, while the majority has abandoned the fields” (I3, October 2018).

⁹⁷ The translation is “if you don't get pollution from the air, then you get it from the ground, so here in Gela you have no escape gate”.

Both the decrease of crop variety and the neglected fields reflect the overturning of labor dynamics after the launch of the petrochemical activities. During the last decades, in the hope of being hired by the refinery, many youths gradually became detached from traditional economic activities. Consequently, the entire system of relationships that constitutes the socio-ecological infrastructure of the landscape of Gela began to dissolve, as the story of a farmer and a young activist I interviewed prove:

“You have to know that today the few farms in the plain of Gela are usually owned by people coming from other villages (...) wherein people were not blinded by the illusion to work in the plant. (...). That's why agriculture is still a profitable sector of their economy (...). The new generations of Gela were not interested in working in agriculture anymore (...). Now there are so many unemployed people as well as so many derelict fields" (I 12- WI 2, January 2019).

“My father worked with SMIM, a large satellite company, he had to deal with pet-coke and transport. My grandfather went from cart to truck. It is that local history that you will often find of country people and they have been put there to work (at the petrochemical). My family mostly comes from a connection with the countryside. Then the industry offers him that safe job (...). And we lost everything in the end then. Because the agricultural countryside is abandoned, there is industrial work and there is not, because in the 70s the strikes began and companies began to lose jobs (...). What can a young teenager from Gela tell you today? Yes, my grandmother had land in a certain area (of the Gela plain). But if you ask this teenager. "What are you doing (with these plots of land)?" This teenager will answer "Iu nenti, più mia za possuni teneri docu! (I don't know what to do with these plots of land! For me, these fields can keep staying where they are!)". This response is the result of ENI's experience (...) which eliminated these ideas and these possibilities (related to the agricultural world). On the one hand, it was our weakness (of the inhabitants of Gela), on the other hand, it happened due to the inability of the policy to maintain the territorial originality that was linked to pastoralism and farmers. That reality (linked to agriculture) was Gela. But, I say, at least keep that (agricultural) part. No, but no! We all had to transform ourselves into workers, technicians, architects and engineers. This could also have been nice, perhaps, and if only it had lasted, but (the industrial activity) did not last and when it did last it was not enough for everyone. Because at the beginning it was 7,000 employees out of a total of 70,000 inhabitants, which is already a low percentage, then afterward it reaches 2000, then it is reduced even more, in short, we are talking about nothing, there are very few (the actual jobs). However, at the same time, the rest of the city grew disproportionately with the prospect of industrial development. In short, guys who are interested and want to take an interest in the land you will not find. His father was no longer interested, his grandfather had already abandoned the land for industry. We no longer have peasant grandparents. To find a peasant grandmother you will have a hard time. Because the grandparents themselves will already tell us that, for better or worse, they worked there (at ENI), the fathers either there or in various offices. The sons go to study, work and live directly outside (Gela)” (I 19, October 2020).

The fields in the plain of Gela are, therefore, potentially polluted to slow contamination and frequently neglected due to the drastic watershed in the working and producing landscapes of Gela. The plain of Gela has been seen more and more as a place for extracting oil instead of a place for nurturing soil (Shiva 2016). The peasants who during the early days were taking care of fields were the same who were digging into the land to create the foundations of the plants and then drilling the soil to extract and refine the oil. This ambiguous and double role is a legacy that still permeates the citizens' behavior toward the conflictual juxtaposition job-environment, as an environmentalist of Gela told me while we were trying to trace back the main stages of the history of Gela

“Let's remember that Gela is very strange towards the refinery because it (the refinery) made everyone work (...) And you don't spit on the plate where you ate, this has led to this strange relationship. Also consider that, even if it has never been clearly stated, Gela has no industrial culture. In fact, before, it was a town of peasants who had difficulty making ends meet. At some point, peasants passed from hunger to wages, suddenly finding themselves working inside an industrial plant. Gela has not had a gradual cultural process (...) but in the meanwhile, it finds itself launched into this type of (industrial) economy. Gela almost suddenly abandoned all other economies, and even the agricultural culture has gradually been lost (...) It happened that in the evening the peasants worked in the farm fields, but in the morning they were workers in the refinery, they were all with double work, so if there were oil spills, you did not have the indigenous communities that rebelled and united against as it currently happens in other territories (...) here instead, if it is true that they were farmers destroying their own fields with the spill, but the plant makes them work (...) this is how a social short circuit is created” (I 14, September 2020)

Most of the peasants, blinded by the myth of industrial modernization, left the fields as soon as they could, cutting off radically any relationships with their own rural origins. This abrupt trend erases those affections linked to the peasants-plain of Gela, generating a “lack of memory”. Some of them decided to continue working into the agricultural sector. According to the few available data (La Torre 2011: 27) it is estimated that agriculture is a source of income for around 6000 workers in the plain of Gela. Emblematically, around 80% of the agricultural enterprises are individual farms, meaning there is not enough ability to self-organize in a collective and cooperative way creating “critical mass” and common sectoral goals. There are three main types of production: intensive agricultural systems, fruits crops; extensive and semi-extensive agricultural systems. The first are the most lucrative one -at least apparently- and present an increasing trend. Sweeps of greenhouses cover extended areas between the plant and the Biviere reserve. What is interesting to note, is that these “relatively” few farmers who have decided to keep farming have anyway embraced the modernization myth by applying the technological advancements to the agricultural production. This would not be an ecological issue if would not implied a “knowledge terrorism” (Shiva 2016 :33) considering the soil as an empty death thing to exploit as much as possible. The ruling law of domination embracing the bio-nullios has lacerate any type of affection and harmonious relationship between farmers and their fields. This small, almost invisible change, was pointed out by Mario Carbone, one of the few permaculture farmers of the plain of Gela taking

care of its “Giardino delle Belle” (The Garden of the Beauties). During a convivial dinner in his home made with only fresh fruits and vegetables from his garden, Mario explained me how the current mainstream tech-driven and pesticide-driven farmers has made the famers mere businessmen that while conceive the soil as something from which to extract has much as possible products and profits, even if this implies to poison it, are trapped into debts toward seed and pesticide companies and international corporations. The commodification of the soil has let farmers forget what it means to nurture a prosperous interaction with nature, instead, they have wiped out any affection for it

“They consider being a farmer as a traditional office job. They go to their crop field, pump it out with pesticide, and then after their mandatory office hours they go back home. In the past, the agricultural fields were also your life field, the place where you cultivate, but also eat, drink, relax, sleep. This is why the country land was also your home, and you had to take care of it. You also felt something for your land. Nowadays, a typical farmer lives faraway, most probably in the city, and does not feel anything for his land (WI 8, September 2020)

In other words, Gela quite concentrates the concrete application of the plantiocene, despite in small scale and with the proper caution of adaptation. The modernization rhetoric, even more than the industrialization itself, has hence affected the relationship between individual *forma mentis* - community and environment, inevitably influencing the landscapes of Gela that, nowadays, appear to be a puzzle of intensive monoculture and greenhouses. In addition to the emotional, sentimental, and cultural aspects, this transformation of the social and working landscapes of Gela implies multi-species and coastal justice issues. The original balance between the anthropic agricultural production and the local ecosystems has been highly altered. The endemic typical ecosystems that have always characterized the landscapes of Gela, have been compromised, as an analysis of historic cartographies confirms (Russo et al. 2009). The building of the plant and the expansion of residential settlements dramatically increased the pressure on the coastal dunes and spontaneous vegetation. Nowadays, a dense network of greenhouses overlooks the dune system [Figure 9] and contributes to the pollution of the area, and in place of the variety of crops, there are intensive monocultures [Figure 10]. Some direct inspections I had the chance to do allow me to see for myself the concrete effects of the combination of anthropic zootechnic pressure and industrial impacts on the irreversible process of erosion of the coast. Especially all the areas at the east of Gela, between the plant and the area of Bulala are thoroughly degraded, affecting the typical dunal ecosystem [Figure 11]. In this part of the coast, in addition to the previously mentioned ecological pressure, the attempt of infrastructuring has further worsened its status, instead of improving it [Figure 12].

This transformation can be considered somehow a form of “coastal and marine injustice” in terms of an interspecies injustice that inescapably involves the entanglement of ecologies that can not easily have any agency. Their alteration is another small data of the risk landscapes slowly and violently deteriorated by the manifold unjust human actions. On one hand, curiously, the only action enforced by the public institution was to destine this area to be exclusively for nudists, for soon being converted into one of the many forbidden accesses to the beach [Figure 13]. On the other hand, the Biviere reserve has carried out a long battle to preserve

the seaboard by means of several projects aimed at the restoration of the original ecosystem, as LIFE⁹⁸ (Russo et al. 2011; Carullo et al. 2016). However, still, now the entire area is almost interdicted both from the plain and from the beach: from the plain because most of the fields are closed or private, from the beach because the erosion, the illegal dumps, and the absence of effective entrance, make it almost impossible to get closer to what is left of the eroded beach. It is worth noting that the entire coast of Gela has been the object of further ecological stresses over the past decades. Quite peculiar has been the pollution of the sea and beaches due to oil spills and routine industrial drainage systems. A phenomenon that is more than exceptional became actually part of the daily routine due to which they have started to inhabit their daily living places differently, as the two activists' stories below bear out.

“As children, we always went to the beach, and we all had the experience of tar under our feet, for decades (...); it is a black substance that sticks to the skin and is extremely difficult to remove only using oil, by now the mothers at home knew it (...). Today still every now and then we see that black patina that forms on the shoreline” (I 2, October 2018).

“In the summer during my childhood, we used to go to the beach right next to the refinery. Now that I think about it, it seems absurd to me! But many other people used to do the same (...). I remember that it was a very common thing to have our feet stained with tar. Now we do not go to those beaches anymore” (I 1, October 2018).

“When I was 7-8 years (the early '70s) the sea color was often between yellow and brown because ENI drained its sewage and leftovers in the mouth of the river Gela. At that time, the law was not so severe...but we used to swim there. In the following years, perhaps in the '80s, residents started to frequent the waterfront less” (I 7, January 2019).

There are not any systemic studies and monitoring of the sea conditions, and these autobiographical stories, in addition to disclosing the slow contamination as is perceived by inhabitants, constituted a form of insurgent knowledge that otherwise would not be possible to collect. The absence of any mainstream and expert scientific knowledges regarding water contamination makes the information coming from local fishermen even more useful to assemble other perspectives on the risk landscapes of Gela.

“I am the son of a fisherman. I was still going to school when I started to help my family by fishing during the weekend (...). But over time many things have changed and the job is not the same anymore. Some species of fish and plants have disappeared or been modified. For example, in the past the seabed of the roadstead of Gela was plenty of Mediterranean seaweed, today there is only sand there. It is weird that the only raising flora is a tropical seaweed that has found its natural habitat in our water, which is becoming increasingly warmer (...). Many types of fish are now impossible to find, such as the "cefalo" (mugil cephalus), the "Occhi di Santa

⁹⁸ The LIFE Programme is the EU's funding instrument for the environment and climate action.

Lucia" (*bolma rugosa*) and also "muccuni" (*nassarius mutabilis*), in the past we used to fish at least 20-30 boxes of them on each ship (...). That is why we have recently founded a committee to oppose further off-shore drilling in the Mediterranean Sea" (I 10, January 2019).

By taking a simple walk on the foreshore between the plant and the urbanized area, many scattered black seashells recount via their polluted matter the story of the toxicity of the Gela territory [Figure 14]. The bodies, both humans and non-human, provide an eloquent example of how matter can be read as a text of perpetrated injustices. The non-human communities incorporate the slow violence, their absence, presence, decrease or increase may be a telltale of the ongoing transformations, as the following two interviews demonstrate:

"I remember that there was a chimney from which we saw yellow smoke coming out every morning, when we passed by to go to work. "What is that?" we asked. They replied "As long as there is yellow smoke, that's okay, because it means that the emission is correct and we use a yellow dye any time the emission comes out properly. When you don't see yellow smoke then you have to worry". Once we didn't see the yellow smoke, four thousand dead birds were found" (I 4, December 2018)

"A few years ago, we found an osprey that was intoxicated (...) it had breathed something at the refinery (...) When they found it, it was still alive and was breathing hard, they did the various checks and it was really intoxicated, then it died later (...) now, I'm not sure what (matter) they found, I know it was the refinery's fault. Who knows how many animals die every day, we don't know but certainly many (...) after all, our territory is one of the areas with the highest percentage of people dying from tumors (...) here we have noticed that for how long the refinery is less active, there is an increase in the population of some bird species, as happened for the stork and other birds" (WI 3, October 2020)

The risk landscapes are the result of the intoxication of an entanglement of all these ecological species, including plants, as an activist told me:

"The surveys were made between '98 and '99, we collected data in the Bulala wood which is a pine forest (...) it was a beautiful wood that, before the advent of the petrochemical, was connected to another wood that is said to have been directly wanted by Mussolini and for this reason it is called Bosco Littorio (...). Then with the advent of the petrochemical they cut it in half (...) of the Bosco Littorio there remained a band of pines that slowly began to dry up, trees 10-15 meters high (...) during an inspection there (at Bosco Littorio) we dug a little, about a meter and a half, and we pulled out some roots, we analyzed the roots, and they were soaked in hydrocarbons" (I 20, October 2020)

The plants and their contaminated bodies are soaked in toxic matters and small data. The toxicity is trans-corporeal and unveils the porosity between human and more-than-human ecologies. Just like animal and plant bodies embed the ecological injustice, human bodies do. As confirmed by epidemiological studies (Sebiomag; SEpiAs; Sentieri), human bodies have turned into bio-accumulators of harmful substances. Furthermore, the

increase in the awareness of the spread of illness is quite recent, as the interview with a middle-aged resident and activist attests:

“When I was a child, many of my school friends had health problems, especially some malformations, but for all of us, it was normal. Only later (...) I realized how serious this was and how much it was connected with the general problems of Gela” (I 1, October 2018).

The truth about the socio-ecological and trans-corporeal transformations of Gela has always been latent but blurred and somehow denied, reflecting the ambivalent behavior towards the ENI company. According to the journalist Andrea Turco (2018), ENI, the unions, the local government, and even the workers and citizens have bedimmed the truth behind a toxic narrative that is still operating (Peca and Turco 2020), and that celebrates the factory as a symbol of progress and modernity through, as I have explained in chapter 3.3, newspapers (Cascino 2009), books (Vasta 1998), documentaries, and movies (Latini 2009; De Filippo 2016; Frescani 2018). This smokescreen was not only due to a toxic narrative that tried to diminish or cover all the unusual health issues, but also due to the fact that the people and their families have introjected a sense of fear and shame whose consequence was to consider these dramatic illnesses as something private to be hidden from the public. This attitude is not the same for any type of illness, as Daniela, whose parents have both died due to cancer exactly during my fieldwork, has tried to explain to me:

“About the "theme of shame" here in Gela there is the fact of being ashamed of having a sick or malformed child or of having a tumor. If you are sick with cancer, there has been shame here for a long time and therefore it should not say that you have the tumor. For many years there was this thing of shaming it, but then fortunately the message passed that whoever defeats the tumor is a hero because one fights against one thing, it becomes even a personal battle (...). On the contrary, those who have a malformed child, will have this child today and will have this forever” (I 2, October 2018)

Daniela's reflections confirm the spread of private responses and individual actions, instead of public and community responses when the disease at issue is a chronic and incurable one (McGee 1999). However, such forms of “resigned activism” (Lora-Wainwright 2017) must not be dismissed as just powerless and a sign of passivity, alternatively, should be accompanied. In fact, differently from plants and animals, humans, even the more subaltern ones, have agency allowing them to “speak through the environment” (Biasillo and Tizzoni 2022) and through “their body”. Not always there was a space for sharing their own experience of toxicity, even the more daily ones. The moments of conversation and interview precisely reproduce such a safe space giving birth to narratives of liberation through the toxic autobiographies, unveiling the experience of living in toxic environments by starting from the personal perception. In fact, the residents of Gela have been physically in direct contact with the harmful effects of the industry in their daily lives and such it was possible to feel with their entire body such a coexistence, as the following excerpt underscores:

“By now the production activity has drastically reduced but during all my childhood and adolescence up until a few years ago, it was at full capacity, and you could perceive this. In fact, the plant was built in favor of the wind, this means that when there was the west the smell was light, but when there was a sirocco day you had to stay closed [at home] because the smell of rotten eggs was very strong. It was so common to feel in the air a smell similar to the smell of rotten eggs (...). But, you know, I did not notice it...it was like normal! Maybe in other cities, there was a stink of smog, whereas in Gela we had the smell of industry” (I 2 October 2018).

The embodied experience of toxicity can be told not only from outside the industrial plant but also from inside, as an engineer who has worked for the refinery and its satellites activities for thirty years told me:

“I lost hearing in both ears, this is proven, it was also a bit of my fault because I didn't use personal protective equipment well, because sometimes I didn't have the time and I worked in an emergency, I had to do things so fast that I didn't have the time. The only thing that is mandatory instead, because if they see you without it, they throw you out of the system, is the h2s detector that a gadget that rings you, the h2s is that smell of rotten eggs (...) who comes from outside has another perception because he feels that the air is different. If, on the other hand, you live there every day, in the end, you get used to it (...) My wife always said to me, “you smell like Anic”. However, there has also been a modification of my body (...) as well as other workers, we collected urine every three months, blood tests (...) and in one of the visits they found traces of benzene in the blood (...) We all knew it was a very risky place. The exact definition is that it was "a hostile place". You had the feeling that you were going in there, and you felt that you were in a place where anything could happen to you, the accident was close at hand, because you consider that all the systems in operation, you entered and if, for example, you did not bring the helmet to smash your head there was nothing. Anything and everything could happen to you. (...) There was a lot of stress, and in my case even more, as I was the construction manager” (I 4, December 2018)

Coexistence with an industrial giant like ENI is not expressed only through smellscape (Henshaw 2014), but also thanks to a daily and minute trans-corporal experience and understanding, as also the following memories confirm:

“The memory of when I was little is that from one of the ENI production departments, there was an ammonia leak, normally the wind is from west to east, the penalized are those of Niscemi and Vittoria, but sporadically the wind goes in the other direction of the sirocco. That time there was sirocco and the ammonia came all over the city. I remember that I was really little and the teachers did not let us out, because they had to end this emergency before allowing us to go out. Our eyes burned, and outside there was this cloud. We only got home around 14-15. So, the first memory of this refinery, the first impact I had is this and I looked at the refinery as if it was a monster. I would have thought of everything except to come and go to work” (I 4, December 2018)

“Before there was little information on the environmental issue, we were used to perceiving that unpleasant smell, which I still remember, the olfactory memory! But I lived this thing without problems, perhaps because

I was a little girl, and I was not very aware, being an ethically very borderline topic (...) Today we have the information and the tools to move forward. At the time, no (...) they were somewhat technical issues and I went to classical high school, and I perceived these issues as very difficult for me” (Alessandra, I 33, October 2020)

Indeed, the air of Gela was permeated with its specific smell for a long time. As Marco Armiero and Salvatore Paolo De Rosa (2017: 172) have argued, sensing can even detect “the penetration of capitalist relations in the body” and be a fundamental tool of "researching the bodily understanding of politics" (ibidem: 174). The nose, moreover, can have relevance for the politicization of people:

“My interest in opposition to ENI was mainly implemented by my preliminary experience with the NO MUOS movement. Thanks to this environmental ferment, I realized that something was wrong. Up until that moment it had been different for me (...) for example when as a child I went to where my grandfather had the countryside in those parts (near the ENI plant), my father used to say "the countryside is beautiful but I don't like it", he didn't like going to the countryside and passing by ENI, where there was such a stench and there was smoke. We looked out from the countryside and saw this thing (the plant and the fumes). But I didn't ask myself many questions at that time. I did not understand that it was something that actually caused damage, there was no one who talked about those aspects. Not even at school. The only opportunity was (...) to get close to the NO MUOS movement” (I 28, October 2020).

During my direct experience it emerged that toxic autobiographies similar to Daniela's, Alessandra's, Graziano's contained or highlighted a whole series of small data that helped me to understand what it means to live next to the former refinery starting from the perceptual dimension of the damage: not only diffused environmental damages, but also biological and above all existential ones. As a matter of fact, environmental distresses, land-use changes, and sensorial and embodied experiences of contamination have also led to a loss of value of the landscape and of the ecological relations among human-society-environment. These relational alterations may be made of almost invisible damages affecting the daily life and difficult to recognize by themselves and to be recognized by others, including institutions. These minute data - perceptual and existential and difficult to be recognized - were a key element in a judicial proceeding initiated by nine citizens⁹⁹ against ENI, together with the MATTM, SAIPEM s.p.a and another series of subjects accused of causing psychophysical damage and compromising the quality of daily life. As can be seen from the proceedings (Judgment 427/2016), the plaintiffs complained about various problems: the anguish, from conception, that their children could suffer from genetic diseases and malformations; living with the stench of hydrocarbons that caused respiratory symptoms; the permanent state of anxiety and fear about their health conditions, which led them to carry out numerous health checks; the feeling of frustration in denying even a

⁹⁹ The reference to the official document about the verdict of the trial is the following: Causa n. 427/2016, Affari Civili Contenziosi Tribunale di Caltanissetta.

walk on the beach or a refreshing bath during the scorching summers to avoid toxic substances; having been exposed to the incessant noise of 24-hour active systems¹⁰⁰. All these arguments, however, have been dismissed as unfounded, since, as stated in the proceedings, they are - according to the judge - "referring to entirely imaginary rights, such as that of quality of life or happiness" and therefore "clearly not deserving of compensation protection" (ibidem: 18). However (ironically?), in the name of "tolerance of minimal injuries" (ibidem) and the need to "modulate one's lifestyle as a price that everyone is required to pay in order to enjoy other rights, which is the one at work" (ibidem: 22), the same reasons were considered sufficient to condemn the citizens to pay the legal costs incurred by the accused. This sentence shows the fragility of a judicial system inadequate in the profound evaluation of the effects of widespread contamination, typical of slow violence and of those disasters that penetrate the daily life of the territories, imposing, in fact, the normalization of dysfunctions and anomalies.

Not only citizens but also justice is bivalent. While the first have to deal with substantive and procedural injustice that regret their insurgent knowledges and their position of victim, the second not only not recognize the already existing inequalities but also produce new ones. A series of events of the history of Gela confirms that the State can be the first preparator of injustice and ambiguous acts (Pulido 1996; Pellow 2016, 2018).

Quite emblematic in this regard is what has been defined as "the petcoke question". Since 1995, the thermoelectric power plant has emitted pet-coke which is a carbon-rich solid material released into the atmosphere during the combustion processes, together with a whole series of primary organic pollutants (such as dioxins). Even though the Ronchi Decree (Legislative Decree 22/97, then transposed in Legislation 152/2006) has prohibited the use of pet-coke, the Gela plant has been the only plant producing it in Italy until the local Court temporarily seized the plant in 2002 after receiving numerous complaints from local environmentalists. However, following intense political and institutional mobilization and "worker riots in favor of pet-coke" (Saitta and Pellizzoni 2014: 259) embracing the motto "it is better to die due to pollution than to die due to hunger", a special law enacted ad hoc by the national government (Decree-Law 22/2002¹⁰¹), converted the pet-coke from "forbidden toxic industrial waste" to simple "fuel". It was a *laissez-faire* to "pollute but within the law" and on the condition that ENI would have modernized the machineries to make them harmful to the environment within a few years. This unveils the ambiguity of both part of the citizens of Gela toward the plant and of the role of the state in disempowering local authorities and environmental requests from citizens (Di Risio 2012b). This event, that as I have explained in chapter 3.3 was widely covered by local and national media, marks a watershed in the history of Gela and nowadays it is mainly recalled as a "dark

¹⁰⁰ Here we are paraphrasing in summary what was declared in the judicial documents of the aforementioned case by the citizens who brought it.

¹⁰¹ It is worth to point out that the decree-law in Italy should be used for urgent legislation only. This is to display how the permanent condition of contamination in Gela has been undermined by both the emergency rhetoric and normative.

side” and “shame page” of the history of Gela, above all by the environmentalism activists I have met. These latter, being seen as the main cause of the sequestration of the refinery by the magistrature, were pointed, isolated and used as the scapegoats by the rest of the local population. Both the sudden closure of the working activities due to the closure order in 2002, as well as the reduction of productive activities and sectors in the following months and years, until the sudden shut down in 2014, all these events in the pro-industrial narrative were accused of being the fault of the “environmentalists”. In other words, in my opinion the petcoke case has actually induced and accentuated a social divide between those who supported the re-open of the refinery and those who opposed it, increasing further the already social fragmentation due to the inequalities, frustration and spread sense of injustice. By looking closer at the clash between official and not official forms of knowledges and acknowledgements some contradictions emerge. A first paradox regards the top-down law the “magically” delete, by means of a mere changes of definition, years of embodied experiences by everyone as well as battle by activists made of surveys, self-collection of data through citizen science activities, below I refer to an excerpt of a interview just to give an example:

“I remember that my mum often had to sweep the layers of pet-coke deposited on the balconies of my houses after the “rain of pet-coke” coming from “stabilimentu”. Nevertheless, the pet-coke is very fine dust, not easy to eliminate (...) Imagine what our poor mothers spent a lot of time breathing it! And imagine, what we breathed when we were children! I remember that we children took this powder in our hands! (...) We discovered that it was powder of pet-coke only later, in recent years, because for us it was the “ENI powder”, the powder that allowed us to play. Now you understand why this high number of cancers in Gela” (I 8, October 2018)

This magic law has hence misrecognized years of sensorial feeling of industrial presence and injustice. But it has also contradicted itself, as this story well confirms:

“Do you want to know what the shame is of this territory? It is here that it is recognized that those damned substances, the powders (petcoke), damage the bodywork of a car, and the owner of the car is compensated, but not (it is recognized) that it damages the human being and the body. human. This is yet another mockery for a territory that is massacred and put on the cross” (I 8, October 2018)

Orazio refers to the case of two cars whose car bodies had yellowish spots. The court acknowledged that the corrosive substances that had damaged the cars were due to the noxious substances emitted by the refinery's torches. The petrochemical company was sentenced to pay around 4,000 euros for each car owner in compensation. In other words, justice for damaged objects is recognized by law, while the ones for humans is not. Paradoxically, Orazio, together with many other citizens, is still struggling inside the courtrooms, to have proved the causal nexus of his dad's cancer. Due to a report filled by a famous university professor and commissioned by ENI, the judge pushed back the final verdict of a long legal battle started in 2007.

Justice has been thrown into disarray/divert/lead astray precisely by these university professors who do not say what they should say (...) you understand well that a judge does not have scientific, medical, and chemical knowledge, in order to evaluate rightly a judge can do nothing but be based on a report written by these "great professors" (I 8, October 2018).

The experience of Orazio, quite recurring in other cases, seems to exemplify quite well the risk of the process of "scientization of politics" – and I would add of justice (Welsh and Wynne 2013: 543), due to which it becomes extremely difficult for citizen groups to question, or to propose alternative to those of science, even if their reasons are "not scientific", but still legitimate and reasoned.

Interestingly, by looking at the expert scientific knowledge on the petcoke topic, it came out that, although the equipment of the SNOX system¹⁰² sought to mitigate sulfur and nitrogen oxides, it still has a significant impact. In fact, two studies on the chemical composition of the thin dust detected in Gela (Bosco *et al.* 2005; Manno *et al.* 2006) have verified the bond between the increase of levels of toxic substances and the industrial activities of the plant. Hence, the doubts and uncertainties about the effects and toxicity of pet-coke have a confirmation in the scientific knowledge, even if produced not in a systematic and complete way. All these different types of scientific and sensorial proof of the effects of petcoke were not enough neither to stop its production, nor to convince the State to take a stand in favor of affected citizens. Only in 2014, after the combination of several factors, the production of petcoke was stopped, but only because the refinery was closed. Between 2002 and 2014 the plant continued to emit petcoke, but since 2010 ENI has to provide each year the AIA to the Ministry of Environment. AIA is an integrated environmental authorization that some very potentially risky companies need to comply with the principles of integrated pollution prevention and control (IPPC) dictated by the European Union if they want to continue to be active. Furthermore, the ad hoc law of 2002 was granted pending a renovation of SNOx machineries. In 2014 in the face of any type of investments and technological retrofit and adjustments from ENI, it was clear that it would have been hard to receive a positive AIA. While waiting for the meeting with the AIA evaluation commission on 27th of May, ENI started a sibylline and threatening communication, as this Open Letter by the local branch of Legambiente to the MATTM and AIA commission denounces:

"Since it has been published the request by the AIA commission to re-evaluate again the AIA granted to ENI (...) all the citizens of Gela and above the workers of Gela have been victims of a thinly concealed strategy of psychological pressure. Inexplicably one sector after the other have been shut down (...) leaving the workers without nothing to do (...) the psychologist pressure on the entire territory (of Gela) has been enforce also through a progressive mediatic bombing, often pad out of half-truths or falsehood and/or guilty inaccuracies,

¹⁰² The SNOX system was set inside the plant of Gela in 1999 for removing sulfur dioxide, nitrogen oxides and particulates from flue gases. However, since 2012 the production of pet-coke has passed under the European jurisdiction, which has placed many limits on its production; in 2017 the plant interrupted the process of pet-coke.

among them (...) “If the MATTM does not authorize the waiver to the limitations on the industrial emission, the refinery of Gela will be compelled to fire” (Legambiente, 2014)

In the meantime, the TG10 that went on the air on the 23rd of May 2014, the directors of ENI plant, declared “The environment is the priority, but the environment is a priority if there is also the industrial matrix in our territory, otherwise the Environment goes off on its own. (Ing. Sebastiano Abbenante, TG10, 2014)

In other words, ENI was trying again to intoxicate the public discourse by both disseminating fears through silent and violent forms of working blackmail, and downplaying the requests by environmentalists as extremely radical and counterproductive for the industrial development of Gela. The AIA commission did not concede any postponement and the plant closed temporarily. Following months characterized by the threat of definitive closure, heated debates, conflicts, strikes, and even the organization of Masses to pray for having the job back, in November 2014 the Memorandum of Understanding (Memorandum) was signed for the Gela Area (Ministry of Economic Development et. al. 2014). This document establishes a new program of local development and the start of a process of reconversion of the petrochemical and industrial area towards one of the most modern green-refineries of Europe. This eco-efficient narrative, besides reminding the previous triumphalist ones, obscures the real facts, such as the slowness of this reconversion and the reduction of employment levels to around 400 of the work units employed in the direct sector (ibidem: 9). The process of formation and enforcement of the Memorandum reproduces the exclusive and opaque path that re-asserts who has the power to decide and who is powerless and without any voice, as the meeting to discuss some clauses shows. It also further concentrates the leadership of the transformations of Gela in the hands of those who have already affected it deeply, negatively, and in a top-down way. In this panorama of reiterated domination, it seems that no room was left for the development of other proposals. This is not exactly true.

A Certain Gender of Activism

In 2016, after two years from the closure of the plant due to the Memorandum, nothing actually happened. About the direct employees in the refinery, only 400 of them were still working in the plant of Gela, all the others, around 1600 waiting in a situation of pending layoffs or have been forced to move to other ENI plants, both in Italy or abroad. Much more tragic was (and is still) the existential conditions of all those workers employed in satellite activities that mostly rely on ENI orders and that obviously were finding themselves abruptly without any jobs. The situation became of extreme depression, crisis and distress impacting indirectly all other activities. Many people started to migrate elsewhere and many small and local shops began to shut down. The trade union organized the so-defined “vertenza Gela” (Gela dispute) consisting of strikes, sit-ins, and other public actions to attract public’s attention to this delay. At this mobilization, in 2016 the “Movement of the Wives of the Former Workers of the Satellite Activities” (Movement of Wives) joined in the battle

asking for jobs, the activations of social welfare programs, and dignity. The leader of this group, identifying themselves as “wives of”, is Marisa Bevilacqua who during a meeting in person said to me:

“One thing is an individual request, you “knock” at the door and ask to arrange your problems in a personalistic way. A different thing is a common problem. Our interest was to let the people wake up to this invisible but common problem of the unemployed people written in the list of availability and waiting to be called to work again (...) For the trade unions to be in that list means that the problem was already resolved, but we were living on our skin what it means to scrape out an existence without any income for the entire family (...) We (the movement she is leader of) are all housewives, we are single-salary families, and we all living the same drama (...) we were acting both as wives and as mothers (...) because as women we suffer much more than others during cold streaks, we have to figure out what to cook for lunch, we have to comfort our husband, we have to take care of our children. Women are able to bear the cost of all these difficulties, but the needs increased more and more (...) our group originated from an impelling need, a question stemming directly from the belly” (Marisa Bevilacqua, October 2020).

This self-organized group of women mobilized different strategies to catch the attention of the media. They have joined the strike of husbands, they have written public letters and talked to the press. They have also published a “public prayer” in which they ask God to give back jobs and dignity to their husbands. All these public activities, that elude the more traditional social position of housewives usually not directly involved in the political dynamics, have generated a sort of empowerment, how it is possible to read between the words of Marisa:

We felt much stronger. We have made sure that we were recognizable, that our problems were known (...) once the women joined the strike in front of the refinery, then, a couple of days after, everything was resolved because we left our mark (...). I do not think that Gela can not change. Gela can change. But it is needed to struggle during the entire life to achieve this change” (Marisa, October 2020)

It is worth noting that, differently from other stories of housewives who have taken over a leading role in civic battles (for instance Lois Gibbs), this mobilization of women has never questioned the social and environmental shortcomings of the industrial presence in Gela. Actually, more recently they have enlarged their interests and actions towards more general social issues, for instance by asking more socio-economic support to distressed and poor families because, as Marisa declares, “everything is connected, battles of working categories and social battles”. Notwithstanding, they have not re-elaborated these requests in terms of doubts to the existing dependence of the social fabric on ENI.

“I don’t think that ENI is the God of Gela. Rather, I believe that also the public institutions and the trade unions have their part of responsibilities (...) however, there is a limit to our actions. Our action (women movement) has a limitation (...). We can not deal also with more general problems. I mean, if we do not want ENI in our

territory, it ok, but then you have to find for us another alternative to work and have dignity” (Marisa, October 2020)

In other words, Marisa, despite being a combative activist, does not take any critical position towards the effects of an extractivistic corporation exploiting Gela, rather delegates to others (States etc.) to find solutions.

Simultaneous to this movement, but quite different from it, is the Coordination of Women for the territory of Gela (WCTG). Born in 2016 as well, and initially including the Movement of the wives, from the beginning the WCTG has tried to intersect different problems with a broader consideration of women, not only of wives or mothers. In an interview with us one of the WCTG co-founders said:

“What happens in Gela is that there is a peak of people who get sick and die. Once the old or the most at-risk people died, but today even young people and children die. The truth is that (...) a carnage is occurring! I witness daily tragedies that affect all of us. The children of Gela are born with many problems. And this reveals that something is wrong. (...) That is, they are massacring us and we do nothing? Or rather, we can't do anything? So, as women, we have to decide: either we sit back and complain or we try to do something. So, we gathered and set up our group (...). I propose to create a coordination of women so we try to say something and do something. Initially we were few people then we grew up to become many” (Luciana Carfi, January 2019)

WCTG has self-organized itself through a series of periodic meetings coordinating through a shared WhatsApp chat. In order to catch the attention of the institutions on the incredible delay of the reconversion process and on its dramatic socio-economic effects, WCTG decided to solicit a series of institutions by writing a letter of desperate denunciation and pointing out the permanent crisis of Gela. Finally, a delegation of WCTG obtained a series of meetings with the president of the Chamber of Deputies at that time, Laura Boldrini, being then involved in several roundtables and meetings with the directors of ENI, Ministry of Environment, regions and trade unions. For the first time a group of civic society seemed to at least be listened to even if not properly involved in the decision-making process. The WCTG decided to share the outcomes of these institutional meetings by organizing some public assemblies in Gela: another rare moment during which it seemed that people had the power to share their concerns. WCTG tried to convert such ferments into projects for the future. As one of the co-founders of WCTG has told me, the WCTG does not only fight against ENI but also fosters alternatives for the economic development of Gela. For this reason, they propose a “pact of sharing” between citizens, social actors and institutions to promote the social, economic and productive development of the city of Gela. The aim of this pact was to co-decide together how to better invest the money committed to spend according to what was agreed in the Memorandum. As Luciana explained to me:

“Our intent is not to be involved in a political match, rather we see our role as a role of facilitator that wants to work hand-in-hand with institutions. That is in the sense of doing things together with the institutions, in order to make known what is happening in Gela” (Luciana, January 2019)

The attempt to catch as much as possible attention to the problems of Gela brought WCTG to take part in a national television program in October 2018 with the following words:

“I am the spokesperson for a group of women from Gela who have some things in common. Which things? Husbands who have lost their jobs, or have closed their businesses, mothers or friends who have fallen ill with cancer, children who die of cancer before they are 30, before seeing their dreams come true. This is because in Gela you get sick and very often die. The health facilities are inadequate, there are few beds, the breast department has no dedicated staff so all the other departments, so whoever needs to be treated is forced to go outside, who can afford it, the others stay (in Gela) and you can imagine what can happen. Yet Gela is a beautiful land, with beautiful sunsets, full of history and archeology and golden beaches. Gela is a diamond set between Agrigento and Ragusa, only that it shines much less since we have the petrochemicals.

There is nothing left, only the courage to fight, the courage to scream! For this reason, I am here today, as well as the many associations in my city that try to work and the many young people who want to redeem this territory.

Today I am here to shout in the face of all the institutions that have a responsibility in our territory to hurry, help us, help us and listen to our cries. Reclaim our land, allow sick people to take care of themselves, our children to return, to take back the future of their city in their hands. Let us come back to life. Ours is a battle of love and development but alone we cannot win it” (Luciana Carfi, Nemo, November 11, 2018)

As it can be seen in these words, the issue of prenatal deaths, malformations, and illnesses is a crucial manifestation of the environmental injustice imposed on the community and speaks of the transgenerational impact of contamination and of its toxic legacies (Sandlos and Keeling 2016). Birth defects or miscarriages are generally private matters; however, in Gela, they have become increasingly political issues, part of collective narratives instead of private memories. The WCTG had a crucial role in this shift.

Furthermore, from this touching speech, as well as from the words of Marisa, it can be underscored how industrial development seems to have impacted differently the people according to their gender. The modernization process has been mainly a masculine issue since it has directly involved the men, not the women. Most of the workers, directly employed in the petrochemical plant or in the satellite activities, were white men, local peasants, or technicians and engineers, at the beginning mainly coming from the North, then also from the South and from Gela. Just a few women found a job as secretaries or assistants over the years. Women have been mainly cut off from any (both rhetoric or real) innovative social change. The industrialization of Gela has therefore further reproduced and accentuated the working gender distinction according to which the woman is relegated to a position of care economically and relies on the man, who is the breadwinner. Of course, nowadays, many things have changed in relation to women's social role and independence, but this for sure has not occurred thanks to the arrival of the modern plant who has instead further excluded women from any process of emancipation and empowerment. This dualism between the

women who are not yet emancipated from an economic point of view, i.e. dependent on husband's income, and women who benefit from a more independent position is reflected in the different type of battle, even more in the contents than in the tools, that these two women movements have put in play. Both groups use their position as mothers and wives as an added value that accredits their ability and sensibility to understand the crisis of Gela. However, the politicization of body and illness as a discursive argument to ask for justice and to point at the refinery as one of the main causes of the crisis, can be found only in the words of those women who do not depend on the husband's salary by ENI to carry on. In other words, in WCTG experience "the Personal is (somehow) Political" (Hanisch 1970) despite there is not an attempt to turn the personal into scientific.

The female understanding of the risk landscapes of Gela has entailed other different collective reactions that do not always take a political side or an openly critical position, instead take the shapes of "smaller" or silent daily practices. Among them, I had the chance to intercept the non-profit ADOS Gela - Italian Association for Breast Operated Women. Founded in 2003, this group of women volunteering in the hospital of Gela, is not easy to contact using the classic digital channels, such as Facebook, Instagram, or other websites, they are immersed into the daily frenetic routine of the hospital and in order to talk with them, you need to go there in person. It was in this way that once I was looking for Grazia Lo Bello, who is one of the founders of this association, I was lost in the hospital of Gela, a nurse told me "if you are looking for Grazia Lo Bello, I don't need to give you her number. You can always find her in the Breast Unit from morning until afternoon". And I actually found her right there. After having introduced myself, she spent a few minutes with me because she had "so many patients to look after". Then she quickly introduced me to Dr. Di Martino and gave me the book *Angeli Gialli* saying: "Here you can find everything, read it and let's talk whenever you want". It is a volume that is almost unavailable in local bookstores (or rather in the local bookstore, since there is only one in Gela!). As confirmed by national epidemiological studies, multiple scientific publications, and regional reports, breast cancer is one of the main causes of death for women in Gela (Cernigliaro et al. 2017). The volunteers of the association take care of other women with the same pathology. They experiment with mutual support as a coping strategy to not let other women feel alone. A similar approach can be found in another volunteering group made of almost only women as well and called Fusing together Cancer Research Assistance & Culture (FARC & C). This association was born following a personal experience of the founder who, after losing her best friend affected by leukemia, in 2006 decided to turn anger into a volunteer initiative, the FARC & C association, with the aims to help people with cancer. This group combines actions of solidarity among patients with the organization of cultural initiatives aimed to both inform the population on how to prevent cancer and to collect money for supporting people struggling with this illness. The group is made of previous patients who were able (and lucky enough) to beat cancer, but also of simply volunteers and experts, such as psychologists. One of the psychologists has started a psychological group path with a few patients in order to reflect, become aware of the illness, and learn how to handle it, and convert it into a propositional factor of their life, instead of a depressive one. Although this association theoretically is open to everyone, regardless of the gender of

belonging, most of the volunteers are women. According to the point of view of one of the co-founders, this is the reason why:

“Women are more likely to join together, women are more likely to give testimony, but men are always afraid (...) It is a gender issue. We (women) are stronger on several fronts. Also on the idea of getting together and helping others (...) It is no coincidence that I have seen many women come to do chemotherapy alone, while men are always accompanied by their wives (...) The man tends to hurry up because he has to go back to work and that's it, he doesn't have the time to dedicate the support to the other man (...) he thinks that he has to go on and that's it, without getting lost in chatter. While we women, here we have this sense of aggregation” (I 24, October 2020)

Both in FARC & C's discourse and initiatives the ill body is central, actually the women's bodies for the reason aforesaid. Some examples are several initiatives to cultivate the “womanliness” even during the worst moments of chemotherapy. At the chemotherapy sessions, the volunteers of the association match/combine/accompany/add make-up appointments involving nail and hairstyles. Beyond the possible critique that can be made on the way “womanliness” is conceived, the point of their actions is the use of solidarity as an arm to struggle together against the illness. They have not only carried out these types of small and solidarity gendered actions, but also more provocative ones. One example is the use of the ill body as both a tool of denunciation of the lack of sufficient healthcare infrastructures and of sensibilization and information on this topic. Under the motto “Twelve shots to say 'no' to cancer and 'yes' to life”, the 2018 calendar shows for each month the picture of a smiling woman who is still under chemotherapy or who has recovered. The body and face of this human become a symbol of an ongoing battle that hundreds of citizens of Gela are carrying on. Also, in their actions there is a form of politicization of ill bodies (Iengo and Armiero 2017), despite the fact that the turn of the personal struggle into a political one is not exactly neither explicit nor systematic. This is also because efforts to take on a politically decisive role have encountered several obstacles. In addition to the recent rejection by the judge of his request to be able to constitute/sue as a civil party in the trial for "environmental disaster", even the proposal for an online cancer census to make up for the absence of a public register of cancer patients in Gela was not followed up, as again one of the co-founders told me:

“We had tried to set up a platform to start an online census (of the people affected by cancer in Gela) [...]. But they (the official healthcare managers) told us that we can do any data-research we want but it would not be validated, because to validate it the official procedure provides for three investigations: the official cancer registry; the histological examination and the death examination. But these categories often do not coincide [...]; in short, even if these data are in our possession on the online platform, we cannot ensure that they become official and scientifically proven” (I 24, October 2020).

In this initiative, it can be read the attempt to convert the personal into both scientific and, therefore, political (Brown and Mikkelsen 1990). By collecting data on the total amount of people having cancer, data that is until now not available, FARC & C sought to put pressure on the public institutions in charge of healthcare to

improve the services for patients in the hospital of Gela. A similar project, if it would have been conducted to the end, would have allowed the construction of scientific knowledge through a form of online popular epidemiology, while this same knowledge would have represented the foundation on which to base the political requests. Unfortunately, this proposal has been opposed almost since the beginning, and it is still unfinished.

All these actions so far mentioned have in common the fact of being collective actions that despite do not face head-on the unjust environmental roots underpinning the health issues, use the body, with reference to the gender, as a way to denounce injustice and ask the public institutions to invest in public health and social infrastructure. Almost absent is any collective mobilization intersecting gender issues with environmental ones. The only exception is the newborn association “Giovani Arcobaleno Gela-GAG” (Youth Rainbow Gela) that use its online page to sensitize the community of Gela on the LGBT themes and struggles, being able to also organize some public events, something that is still revolutionary for a quite conservative town as Gela is. On the same page, they used to share and spread some data from Greenpeace regarding the environmental impacts coming from the refinery and the oil business of ENI in the world and in Gela.

What I mentioned so far mostly regards collective actions that, in a very different way from each other, are connected with gender issues. Making collective, and therefore most probably political, the personal is one of the fundamentals of the feminist movements and epistemologies. I do believe that paying attention to the personal account of how the industrial presence impacts daily life and the relationship between humans and the environment provides an overview of forms of insurgent knowledges, having scientific value. In this regard, the story of Virginia is quite emblematic. After many years of study in other Italian cities, she has decided to back and settle in Gela. From the beginning of her return, she has felt the need to improve the quality of life of Gela and to do it by owning as much as possible scientific knowledge and awareness on the existing environmental risk. This is why she soon joined already local environmentalism groups already operating in Gela, such as Legambiente. She has then converted her commitment to civic environmentalism groups into direct involvement in the political representative system so that since 2015 she has been elected twice as a town council member of Gela. Her story is therefore a story of activism converted into personal and direct political engagement. However, a series of personal experiences have guided her toward some choices, as she shared with me in front of an espresso that lasted more than three hours of conversation:

“It is in the same period that the GAS¹⁰³ was born when I got pregnant. While I am pregnant in 2010, we talk to a small group of people and we think about what our nutrition could be like during pregnancy, weaning and breastfeeding (...) there was a media bombardment on the problems health in Gela, and the fact of being a future mother, and even my sister was pregnant (...) we went into crisis (...) For us it was problematic to carry

¹⁰³ GAS is the Italian acronym of “Gruppo di Acquisto Solidale” which are an Italian-based system of purchasing goods collectively. These groups are usually set up by a number of consumers who cooperate in order to buy food and other commonly used goods directly from producers or from big retailers at a price that is fair to both parties.

on this pregnancy, we forgot what sex it was the son, we arrived at the various visits of the gynecologist asking for hands, feet, etc. lengths and distances, weight, to understand if the child was healthy or not. This fear affected me a lot, so I only wanted a child. Both my sister and I were left with only one child. We have been conditioned by both prenatal risk and risk in their evolutionary growth (...) Today we have a fairly niche standard of living, we avoid taking drugs, we focus a lot on our immune system with correct and seasonal nutrition. Since we started with GAS our diet has been very organic and only with pesticides. It was precisely in that period that the "sustainable territories" network was born and we decided to carry out this initiative together with attention also towards agriculture, all themes still present in my political battles as a city councilor (...). I believe that this sensitivity can also be experienced by a man, of course it depends on everyone's sensitivity, but for example, I began my career as a mother with a very determined approach on the food issue, on my daughter's health (...). I understood many more things about pregnancy, but my experience with Legambiente, which began many years earlier, when we supported IFC to collect data on malformations in Gela, strongly influenced my pregnancy" (I 16, October 2020)

In her toxic autobiographies, the awareness and fear of living in a contaminated place and the embodied experience of risk landscapes are inextricably connected with the activism experiences and political engagement in a positive cycle in which personal, scientific and political are intermeshed. Also, all the stories merging personal, political and scientific according to the situated experience of life several women further corroborate the importance of looking at the ages or movements of great social change in terms of their liberation or repression of women's potential since significant turning points in history may not have the same impact for women as they do for men (Sandercock 2003: 47-48).

Stories of (Un)critical Positions, Environmentalisms and Insurgent Practices

The aforementioned stories, memories of injustice and embodied experiences are already (in)tangible proofs of the presence of an insurgent knowledge and awareness about the slow toxic transformations and diffused damages shaping the risk landscapes of Gela over decades. Nonetheless, the process of lucid discernment can not be taken as something granted, instead it has been the fruit of many frictions, collisions of views and conflicts.

This can be better understood through the comparison of some autobiographies. A biased and uncritical account of the story of Gela through the personal experience is the one coming from Carmelo Vasta, a retired employee who has published "Gela...e poi venne il petrolchimico" (Gela...and then the petrochemical came) in 1998: a real praise to ENI. His commendation sounds as follows:

"During all this period (working period inside the plant) I established myself professionally. I have always seen in my superior someone to imitate thanks to their professionalism and preparation (...) after all the history of the plant is also a work by men (sic!) who have made an effort and are making an effort in order to let the

reality (of Gela) make progress and keep projected toward an industrial context always more modern” (Vasta 1998: 143)

Carmelo not only lauds in each page ENI and the unique opportunities it has provided, but also denies any responsibility of the company for the degraded condition of Gela, assigning to other actors the entire accountability:

“Despite the evident benefits, the industrial plant has been always opposed by the local political class. The full development and the improvement in quality, that the town should have done, by also taking advantage of the collaboration that the ruling class of the company has always provided, have never been completely accomplished (...) Is it maybe the fault of the industrial plant if the urban condition is a mess in Gela? Is maybe for the fault of the industrial plant if have not arisen further entrepreneurial activities?” (Vasta 1998: 138)

If this testimony from Carmelo Vasta after all confirms the partial position of all the workers that have espoused entirely and uncritically the myth of modernization and industrialization, being blind toward any of the consequential drawbacks, the autobiography of Grazia Lo Bello shows the internalization of such toxic and mainstream narrative inside all citizens, regardless their direct involvement as workers, revealing how a colonization of the imaginary of people has taken place:

“When I went to Gela to visit my family, I felt even poorer. There [in Gela] things had changed; a large petrochemical plant had been built; Rizzuto's countryside no longer existed and my father had received some money in exchange. My brother-in-law worked at the factory, so he had obtained a beautiful house in the Macchitella residential area (...). I begged my brother-in-law to help my husband find a job and when he told me that he would be hired as an electrician for a company that operated at ANIC, I jumped for joy. We moved to Gela where I felt reborn (...); from this condition the relationship with my husband also benefited. We bought the first car (...). I had definitively left behind my father's childhood, poverty and impositions [of peasant life] and was projected towards the conquest of a new reality: that of the progress and well-being of the seventies that promised easy life and happiness” (Fasciana 2013: 47).

This type of autobiographical narrative emblematically represents a "triumphalistic" interpretation - which tends to exalt the modernist myth of progress and conceives the manifestations of a profound renewal of local life, including the purchase of the first "objects of happiness" (Ahmed 2010) as a direct consequence of the industrial settlement (Hyttén and Marchioni 1970). The testimony just cited also reveals how, despite the fact that the petrochemical plant turned out to be, on balance, a very high cost item in the overall (environmental, health and social) budget of the Gelese community, the miraculous narrative concerning it, linked to the "promise of happiness" (Ahmed 2010), has become an integral part of the personal and collective self-narration of its inhabitants. This is due to the fact that sudden modernization has for decades appeared an indisputable dogma, a postulate of existence that has only recently begun to falter, with the gradual reduction and disposal of entire fossil and chemical production chains.

The damage to one's daily lives and experiences is difficult to recognize. Often the toxic routine and the habituation to living together with a full-blown source of risks make it difficult, even for the rights concerned, that discernment that allows you to declare that "you do not want to be polluted according to the law", as do other subjects in conditions of environmental and health vulnerability in other rebel territories. A similar inurement also hinders the overcoming of the personal "ambivalence regarding the issues of industry and legality" (Saitta 2009: 161), as well as the autobiographical memories of Andrea Turco, activist, writer and journalist born in Gela, highlights:

“As a child, ENI was obviously the place where my father used to go to work (...), so the presence of the plant is first of all linked to individual moments of personal life, even small ones, for example I remember when together with my mother we waited for my father finished his shift, he came home with his overalls all dirty (...), only later did it turn out that these overalls were full of heavy metals and today there is an obligation to leave the overalls inside [the factory] and workers go out in civilian clothes, but at the time the problem was underestimated to such an extent that workers preferred to wash their overalls at home, obviously flooding the washing machines, and bringing pollution into the family (...). Up to the age of 18, perhaps also due to a sort of bubble that my parents created - thanks to the fact that they worked and ate with the establishment -, I lived with a sort of denial of risk. To tell you a trivial matter (...), when I was little we went to the stretch of sea very close to the plant, for me it was normal, it was fine, I didn't have the problem that less than a kilometer away there were the jetty and the discharges of one of the largest petrochemicals in Europe (...). It was towards the last year of high school that I started attending left-wing political circles (...), even if the local branch of the communist refoundation party did not talk about the environment, but there was a certain humus that I had never experienced until that moment (...); it was there that I began to look at the industry with more critical eyes (...) and it was then I who asked the question at home, not without personal and family conflicts. Of course, it was not an immediate enlightenment, I would define it more as a gradual process” (I 1, October 2018).

In addition to the toxic narrative that has been spread on purpose, other collateral motivations have made it hard to have such discernment, as this piece of conversation clarifies:

“The central theme of those years (80s - 90s) was the criminal question (...) also, we lived in the period of full unauthorized building, what I mean is that we grew up in a contaminated environment from many points of view, both cultural - these are the years in which the non-respect of the rules, even the simple building rules is a normal thing - and of environmental contamination. But above all crime, from the 90s onwards, I remember that I went to elementary school and then to middle school and there was a curfew, there was difficulty in going out, I remember the massacres, the massacres, the deaths of the mafia (...) we grew up this way with these problems” (I 16 October 2020).

Virginia's words frame the topic of environmental contamination towards a bigger historic picture in which the town of Gela has been dealing with many other issues connected with the local mafia, called “A Stidda”.

The words of Andrea uncover which are the reasons that have led him to start embracing a more critical standpoint. Attention to the environment and health, in addition to having a matrix of political commitment - Andrea's case is emblematic from this point of view - can also derive from an ethical-cultural choice, as the President of the FIAB Gela, the local branch of the Italian Federation of the Environment and Bicycle, said to me:

“My experience is that up to the age of 16-17 - perhaps also because I had never had any particular family problems related to the refinery - I did not perceive it as something negative. Yes, [the petrochemical] was there, it was there, it was normal (...). My environmental sensitivity arises later, from a series of casual encounters and readings (...). So, I didn't have a personal trigger event of anger and revenge. Mine, on the other hand, was an intellectual choice (...), it is an environmentalism not only of denouncing the pollution of the refinery, but of a proposal (...). Thus, we begin to carry out activities to promote sustainability, environmental protection and the promotion of cycle tourism” (I 14, September 2020).

Not only scientific reasons, but also personal motivations have pushed citizens to mobilize and self-organize. The sense of injustice perceived towards loved ones is at the basis of the establishment of the spontaneous Committee of former workers and family members of the workers of the Clorosoda di Gela department (now disused). Particularly significant was the death of most of the employees of the chlorine-soda department of the plant, renamed by the journalists and the workers "the killer department". Their suffering and deaths not only have represented a case of the embodiment of environmental injustice but also have revealed the pivotal role played by bodies as potential narrative tools and space for politicization (Iengo and Armiero 2017; Armiero and Fava 2016, 79), as in the excerpt of the interview reported below, explains Orazio Mili, son of one of the many victims of the petrolkiller¹⁰⁴, which for years has been carrying on a tireless judicial battle against ENI.

“All the problems and evils of Gela arise precisely from that damn plant, because the chemical concentrations and chemicals used were varied (...) and my family and I experienced firsthand all the drama that Gela lives, because my father worked at the Gela petrochemical plant (...). In 1994 they began to dismantle the famous chlorosoda-dichlorethane plant, not surprisingly called the “killer department”, where our parents gave their work [...]. We learn that out of 105 workers in the department, 39 have already died from cancer. Among these, in fact, there is also my father. In 2007 my father's illness began and we began a real ordeal [...]. In the end, like my father, other friends and colleagues of my father had died a few years earlier [...]. The question is, I know who the killer is! So, what do I do? do I have to shut up? No. I know the killer and I have to defend myself from that killer, and I have to bring justice to those who gave me life (father) (...) and from everything

¹⁰⁴ The neologism “petrokiller” comes from a pretty influential book of Bettin and Dianese (2003) regarding the petrochemical plant of Marghera, close to Venice. With this title, the authors want to underline the link between oil and the health issues and deaths due to the oil contamination.

that really comes the desire to say "here we must act and something must be done!". But, to explain myself better, something not for ourselves, because we were screwed or they had understood that they had been screwed, but for our children and our grandchildren. And therefore, the desire to fight and everything else I did after (...). I want to point out that this is not a compensation factor, on the contrary, it is above all a factor of social cause and social well-being, because living in a contaminated land we are understanding what it means, and we are paying for it on our skin (...). With all due respect to a colossus (ENI), which has given and feeds various families, and this merit must be recognized, but the past years have been dramatic years and no one will be able to cancel with a simple cash compensation (...). It would be more beautiful and interesting if a company like ENI, instead of bringing professors and super lawyers to the various courts, came to tell us "sorry, I was wrong" (I 8, October 2018).

The biographical account therefore assumes a dual function, both therapeutic with respect to the painful relationship with one's own living environment, and one of denunciation and dissent. The employees and their relatives started to tell their own stories, transforming the afflicted body into political discourse, as the self-produced book of Giuseppe Esposito Paternò (2012), the son of one of the many victims of the killer department, shows a citizen originally from Gela who, after so many years spent in northern Europe, had to return to Italy precisely because of the father's illness. In his book, he narrates his father's cancer, the feeling of loss, suffering, and injustice, and also the creation in 2016 of the grassroots Comitato delle Famiglie Vittime del Clorosoda (Committee Families of the Victims of Chlorine Soda - CFVCS):

“The more my father's illness went on, the more my knowledge on oncology in general went on and that of the city of Gela in particular. I learned that Gela had been declared a city with a high environmental impact and that there were double the number of cancer patients and malformations compared to the national average. I began to get to know the world of local healthcare and I saw something that is still paradoxical today. In a city with a high environmental risk, there is no hospital ward ready at 360 ° to welcome the sick and treat them where possible, and in the most serious cases to assist the family that has to suffer from the process that causes cancer (...). You cannot remain helpless to what I saw, I lost my father who was 57 and two years ago I lost a great friend of mine to a brain tumor (...). He was 28 years old (...). The chemo my father underwent took place from 10:00 until 14:00. If I remember correctly my father's period lasted 3 days and he did this journey every 28 days. It has happened several times that there was neither the passage nor the way to accompany him to the hospital for his session. (I remember that) there were summer months in which the sun was felt in Gela and also a lot. My house is more or less 1 km from the hospital and when we had to reach the cancer hospital department, we did not have the power to do more than go there on foot. They are heartbreaking memories for me” (Esposito Paternò 2012: 87-95).

The death of most of the employees of the chlorine-soda sector of the plant, renamed the "killer report", represented a case of environmental injustice, but it also revealed the crucial role played by the body as a narrative tool about environmental changes and as an arena of conflict (Iengo and Armiero 2017). This sector

of the plant was highly at risk because it was dedicated to the synthesization of toxic chemicals, such as mercury and chlorosoda. In 1994 the chlorosoda ward was closed and those who worked there went into early retirement. Accidents at the factory as well as accidental deaths had happened in the past, but what happened in the aftermath of the closure was more impressive. In fact, slowly the former workers of that department began to get sick with rare diseases, and gradually many of them began to die. Together with his family and other family members, they began to investigate what could be the cause. The company, however, tended to be vague in its answers or to provide scientifically proven truths that did not convince former workers. For this reason, they formed a committee, the Families of the Victims Committee of the Chlorosoda department. The characteristics of this committee are different. First, like the mobilization analyzed above, the committee was born from a tragic personal experience and asks for justice and asks for it through the court. In fact, there are various criminal and civil cases in progress. Another feature is the communicative language, which often makes use of the use of the disease and, in some cases, of personal pain and of the sick body as a tool to raise awareness. For the committee, embodiment is not just a natural / biological fact, but also a political one. Finally, starting with demands for personal justice, the issues addressed by the committee embraced broader issues of justice and health, within the workplace, and across the city. As in the previous case, this mobilization did not take place in the streets or through a collective mobilization, but by delegating to the court or through the press. From these excerpts of interviews and texts it is clear what Iengo and Armiero (2017) call embodiment politicization, i.e. the politicization of some inhabitants following the advent of the disease and the use of narrative devices that refer to the intoxicated body to raise awareness and support their struggle. In other words, there is a dynamic similar to that studied by Adriana Petryna (2004) in the post-Chernobyl period, a form of "biological citizenship" by virtue of which all those whose health is endangered or irreparably damaged by the impact of environmental disasters use the theme of health to bodily claim the need for biomedical resources, social equity and human rights. The pain linked to the body and its disfigurement due to the disease is also the leitmotif of the stories present in the ADOS book already mentioned. "I imagined my body as a city that was preparing for bombing in a period of war", reads a testimony (Fasciana 2013: 96). In this case the relationship, painful or conflictual, with one's own living environment and with the theme of the causes of the contracted pathologies remains, however, little unraveled. A similar attention to the body, but without any reference to the political but only to solidarity theme is "Io voglio vivere" (I want to live), written by Giacomo Giurato who, since he discovered to have an incurable myelofibrosis, an uncommon type of bone marrow cancer, has committed himself in a tireless battle to improve the healthcare system of Gela and in a activism of solidarity and charity towards other human beings.

Sometimes the link between the activism and the personal previous experiences is not granted and direct, but somehow latent in the memory

"Unfortunately, if you don't fall for it on a personal level, if it doesn't happen to you personally, you don't pay attention to it. A flaw we all have. Before, I had had a problem at home but I was such a child and there was and there was no interest at the time. And if the same happens to you with a dear friend, you ask two questions

(...) my father worked with a big company called SMIM, he had to do pet-coke, with transport (...) in the meantime over the years '90 comes this blow (refers to the death of the father). Two years earlier he had had an accident inside the implant, he got a tube in his head, he went into a coma for two months. This story is resolved by analyzing the case and he seems ok and out of danger, he goes back to work, but from then on my father begins to suffer from migraines, headaches, but also strong crises that lead him to be unmanageable and with crisis epileptic, but also temperamental and the doctors of the time did not see the need to take a tak, which instead is done today even for simpler problems, to check if there was a consequence to the accident that had taken place. Then my mother gives up, the seizures increase, the medicines no longer have an effect, this tak is finally done, but it is done when it is discovered that the brain is already full of metastases, the tumor started from the cerebellum, and had spread for the whole skull. They take him to Catania at the end of November 1990, they operate on him, he loses the ability to walk and his sight, he can no longer move, he becomes immobile, he no longer shows signs and so he dies. The doubt remains, of course, was it the accident? Wasn't it an accident? What was the cause? Doctors said the accident might be the reason, and that if it was treated earlier it could be treated better. That brain injury occurred because it was seen in the tak, instead of making it progress like this, it could instead be recovered. He did the damage to him either on a chemical level or on a problem management level. I remember my father who got into the ambulance with his feet, and who came back with the stretcher, dead. They are shocks that remain to you, they are not memories. These are the shocks that I keep because I want to remember them” (I 19, October 2020).

Personal reasons have stimulated the actions of two other onlus associations called Aria Nuova (New Air) and Amici della Terra (Friends of the Earth), which have marked the history of local environmentalism, since the nineties, above all through a lively judicial activism.

“My father, my uncle, my father's brother-in-law were dead (...). All died of cancer (...). We understood that the situation in Gela was very serious, both in terms of cancer and in terms of the environment. We had to do something” (I 20, October 2020).

The reasons behind their mobilization are, at least initially, strictly linked to personal experiences, such as the death of some family members or the realization of the widespread environmental contamination through first-person experience. The absence of official and systematized data concerning the environment and health in Gela has prompted the members of these groups to activate a form of popular epidemiology understood as a practice of resistance that makes it possible to make up for "guilty gaps" of information (Irwin 1995; Saitta and Pellizzoni 2009: 178). This type of activity concerning the symptoms of contamination on the body and the presence of diseases has been accompanied by another activity concerning the collection of purely environmental data. This self-organized form of "citizen science" has led to the self-production of much information on the presence of toxic substances in the air, water and soil, between the '90a and the 2000s. This has also resulted in considerable scientific learning by activists. Furthermore, The relationship with the institutions was conflictual and non-dialogic. The request for justice has mostly occurred through judicial

delegation, or by sending a whole series of cases to the court. In my opinion, focusing only on the court as a path to obtain justice is a wasted opportunity while it would certainly have been more challenging to make the data collected become the subject of public debate. The story of Aria Nuova and Amici della Terra is relatively new. The same activists of these two associations founded in the '90s another environmentalist association called *Mediterranea*, that in 1999 flew into a national environmentalist association called "Italia Nostra" (Our Italy). Italia Nostra is one of the main Italian not for profit organizations dedicated to the protection and promotion of the country's historical, artistic and environmental patrimony. Despite this matrimony and affiliation with Italia Nostra has played a crucial role in a series of trials and closure of the plant, in 2004 Italia Nostra closed its branch in Gela, this is how Aria Nuova and Amici della Terra were born. According to the account of the activists of Aria Nuova, the struggles that they were carrying on started to touch some powerful lobbies and became too inconvenient for Italia Nostra. Curiously, all the international and national big environmentalism groups, such as the already mentioned Italia Nostra, but also WWF, Greenpeace, Legambiente, do not have any local branches in Gela. It seems that some campaigns can be more easily endorsed at a general level, than at a local one, especially in a critical uneasy place such as Gela is. An explanation about this absence comes from the NO TRIV Committee of Licata, a village close to Gela whose economy has kept to be centered mainly on fishing and that has incredibly mobilized once new drilling concessions have been granted to ENI in front of the Licata gulf. Below what a member of NO TRIV Licata told me during a long conversation we had in a bar of Licata together with many other activists:

"During our mobilizations, all the associations but really all were with us: WWF, Legambiente, Italia Nostra, but I repeat, there is a substantial difference between Gela and Licata. In Licata there is a driving force which is the territory which, all together, is opposed to new drilling. The territory is fighting for the environment and health. National and international environmental associations already have their catchment area, in the meantime the politicians see that there is this demand for the territory, they can also be exempted depending on the political alignment (...) however in our case there is the perception that ours is really a request of the territory, and in front of a request that exists, it is not useful, neither as a politician nor as a large environmentalist association, to go against it" (FG 2, September 2020).

In other words, according to this perspective, the excessive fragmentation of the social fabric of Gela does not allow the rise of a monolithic and collective request. I agree with this point of view, however, I maintain that researchers should precisely look at and dig into this jagged granulometry of resistance and resilience strategies to discover how citizens have dealt with the lacerations of the socio-ecological relationships. The story of Legambiente is quite a quintessential one. The first group of Legambiente Gela originated from the battle against the electric plant that ENEL wanted to build in Gela in the '80s. Even if this was only a proposal that was never accomplished, it triggered a local turmoil that led to civic demonstrations and to the establishment of a branch of Legambiente. Mainly led by a young and ambitious lawyer, year by year, this group was increasingly managed in a personalistic way by who then became the first mayor directly elected by the citizens, Franco Gallo. He brought part of his environmental sensibility into the political agenda and roadmap, even if a part of

the citizens saw his jump from the civic to the political engagement as a sort of betraying and careerist behavior. In line with a general period called in Italy “the spring of the mayors”, the town council under Franco Gallo introduced many innovations, such as the new town plan (see chapter 3.1) and the participation in a series of national and European funds in order to improve the infrastructure and job opportunities. Unfortunately, despite the huge amount of approved funds, there was no capacity from local enterprises to elaborate projects to use and apply such funds. The local branch of Legambiente, therefore, disappeared for the rest of the ‘90s. A new group of citizens re-open Legambiente Gela around 2003 after the ignited ferment around the petcoke case. This group seeks to have a different position than other local environmental committees, as one of the members explained to me:

“The history of Legambiente has been quite complex and disastrous. From 2003 onwards, we had become credible interlocutors also because we did not say simple slogans such as “let's close the refinery”, which we never said. But we were very uncomfortable, because if you say "let's close the refinery", you are easier to attack also because you are an extremist who does not understand that most of the families in Gela eat thanks to the refinery. We (...) realized that the fabric of Gela was mostly based, certainly in an anomalous and wrong way, on industry (...) On the contrary, ours has always been scientific environmentalism aimed at creating a clear distinction between those who make the complaint as an end in itself and those who, as we did, study the cards to make proposals and inform citizens” (I 16, October 2020)

Between 2003 and 2014 Legambiente Gela drew up several reports, organized conferences and demonstrations on the streets, i.e. influenced the local public opinion, reaching also the national level. It has not only collected and put together some scientific data in order to publish them in its reports, but has elaborated a series of green technological proposals with the aim to conciliate the environmental and health issues with the need of jobs, i.e. Legambiente was the precursor of what is nowadays named “just transition”. Their position became always more inconvenient year after year, above all when they started to demand ENI the promised investments to modernize the filter system of petcoke to make it less toxic. On one side the closure of the plant has been partly narrated and perceived as a fault of pressure by Legambiente that easily turned to be a scapegoat of those moments of extreme crisis, on another side many of the members of Legambiente started to get close to the just born party “Movimento Cinque Stelle” (Five Star Movement) that at that time seemed to more overall and radically embraced the environmentalist ideas. In addition to this background, there was an additional political reason that, together with the previous, has led to the termination of the local Legambiente experience:

“Those years are characterized by discontent and friction between the Gela group and the regional ones, linked to very specific issues, the regional group carried on interlocutions and relationships (and also national), which for us were unsustainable living in Gela, a critical city from an environmental point of view and in which the presence of the refinery was strong. Meanwhile, when there were the elections to the region, the regional Legambiente supports Crocetta's candidacy, for us it was a very strong embarrassment because we knew the role of Crocetta in the refinery and what he had depicted inside the territories, inside the refinery and his role

as facilitator. of the shares of ENI. At a certain point, Legambiente no longer allowed us to join as a club and no longer sent us the documents” (I 16, October 2020).

If Legambiente formally disbanded, the legacy of its more than ten years of activities, can be found into the main contents of the local campaign of Movimento Cinque Stelle in which most of Legambiente activists in the meanwhile flew in

“In 2012 the local group of the Five Star Movement was born and we monitored the situation, and there were young people with experience, (...) At the time they were still called "the Friends of Beppe Grillo" and organized MeetUp, for the whole electoral campaign 2015. We (Legambiente) had a meeting (...) and we decided that we had to take a step forward (...) a small group of us are asking "what do we want to do? Do we want to stay like this or evolve?". We therefore decided to join the Five Star Movement and take advantage of the opportunity of the 2015 election candidacy (...) We campaigned on the issues we have always pursued with Legambiente (...) and my business as a city councilor today is the result of my journey as an activist yesterday” (I 16, October 2020).

It would be reductive to acknowledge only the groups so far mentioned as examples of insurgent practices struggling to unveil the socio-environmental injustices in Gela. Since the ‘90s other critical positions have nurtured battles, forms of activism and knowledge, both in collective or more individual ways.

Another grassroots movement has been the “NO ENI” Committee that came into being in June 2013, following the thousandth spill of hydrocarbons on the final stretch of the Gela river, as narrated by one activist during a meeting with me:

In June 2013 we carried out a very popular mobilization, among indignant and ordinary people. We all met there, [at the entrance to the factory] even if it was raining. Then we decided to meet with open assemblies" (I 2, October 2018).

Its name “NO ENI” expressed a clear political position against the multinational company *tout court*. Perhaps this name had seemed too radical since in less than one month it was converted into "Bonifichiamoci" (Decontaminate Ourselves) and, finally, the group gradually disappeared¹⁰⁵.

“The NO ENI Committee (...) compared to the premises, was a big failure, because it lasted only a few months (...). We were the only ones to make these paths of participatory assemblies. In the first assembly we had held, we had called a protest sit-in (...); then even in September the Parliamentary Commission for the Environment and Territory arrived in Gela, ENI and the environmentalists, parts of the city, including us from the committee,

¹⁰⁵ My impression is that the committee dissolved due to internal conflicts and to the lack of a common goal and strategy. Some of the activists wanted the name “NoENI” because it clearly indicated the culprit of the perpetrated injustices, considering the name “Decontaminate Ourselves” too neutral.

were summoned. Each made their own intervention. At least we took away the satisfaction of saying what we thought to the heads of ENI (...). The committee then became "decontaminate ourselves", when they changed their name, I left completely. But why should we call ourselves "decontaminate yourselves"? You pollute and then am I the one who has to clean up? (...). It is not me who has to make a personal journey to reclaim the territory, but ENI must reclaim the territory (I 1, October 2018).

This short-lived discussion process concerning the NO ENI Committee has its roots into another local mobilization that is the movement NO MUOS. The Mobile User Objective System (MUOS) is a United States narrowband military communications satellite system that supports a worldwide, multi-service population of users in the ultra high frequency. MUOS was located in Niscemi, on the same site where the Naval Radio Transmitter Facility was built in 1991. The construction of the ground station in Italy was halted for nearly half of 2012 by protesters concerned with health risks and environmental damage by radio waves. In spite of the controversy, the site at Niscemi was completed in anticipation of the launch of MUOS-4. Between 2012 and 2014 the peak of collective mobilization was reached. The NO MUOS movement is mainly guided by the extra-parliamentary left, although it embraces many different political groups, including those that advocate Sicily's independence or autonomy. Soon after his election as Governor of the Regione Siciliana (Sicilian Regional Government) in late 2012, Rosario Crocetta started opposing the building of the MUOS because of possible health risks posed by the installation. This eventually led to the revocation, ordered by the Sicilian Region Government in March 2013, of the permission to build the installation formerly granted to the US Ministry of Defense. Regardless of the revocation, the construction works continued and in response to this, the demonstrators started to make lockades in order to prevent US troops and builders from accessing the MUOS site. On these occasions, the protest took the form of various rituals, such as playing cards or performing music in front of the police. Crocetta declared that the health risks were the only reason why the Regione Siciliana had decided to stop the building of the MUOS, in an effort to underscore his loyalty to the US and NATO military agendas. The NO MUOS protesters resist the general protocol of Americanophilism imposed by matters of political convenience, and attempt to deconstruct the myths commonly associated with the US military presence in Italy (Messina 2015). More in detail, they resist the narrative of the liberation from Fascism, and, what is more. It was in this context that the Gela NO MUOS committee was born joining the demonstration strategies of NO MUOS, as Graziano told me:

"I received a lot of influence from my brother (...) I grew up with his influence, he is very close to leftist thoughts (...) in 2011 I started attending the ARCI, we organized the "intelligent holidays" for Christmas with cineforum, ping pong tournaments, open meets, so I had already entered that context. Then I learned about the NoMuos movement, around 2011-2012, I was 13-14, now I'm 23 (...) my interest was growing, and I started talking about NoMuos at school assemblies, I started to make leaflets in recreation. I went to school in Gela but since November 2012 Andrea has brought Niscemi to blockade, to take complaints and blows, I was also taken to the juvenile court of Caltanissetta and Catania. Because on May 8, 2013 we blocked a road because it led to the American base, not letting American vehicles pass, they gave us roadblocks, outrage and violence

to public officials. And then on August 9 of the following year (2014), we invaded the base, we freed the comrades who climbed the antennas (...) We were teenagers who basically acted as a shore between Gela and Niscemi (...) In November 2012 we founded the NO MUOS Gela movement, we are really few, maybe we didn't get there at 10. From the day of the birth of the NO MUOS Gela committee a whole series of initiatives started, a first sit-in at the municipal council, the information gazebo in Machitella every Sunday, volunteering, rallies at white nights. We met weekly to decide what to do. We also organized buses for Niscemi. It was a time of turmoil" (I 28, October 2020).

NO MUOS Gela organized an event on the anniversary of the Allied invasion of Sicily. According to Marcello Messina (2015) NO MUOS protesters attempted to scupper a US Navy parade in Gela, with the motto "Roviniamogli la festa" ("Let's spoil their party"). Gela NO MUOS committee was in favor of the total demilitarization of Sicily, and thinks that these tributes to the US army are superficial and warmongers. The acclamation of the Americans as a nation of heroes and saviours overlooks the role of Italian anti-Fascist resistance. The experience of No MUOS Gela started to lessen from 2014 also due to judicial harassment towards NO MUOS activists, but it has left a mark on activists' life

"The experience of NO MUOS Gela ended because after three proceedings, one administrative, and two penalties, I put a stop to this thing also because it was a bit heavy (...) any action, even if we did them in 200, the by now we took complaints from some people because by now we were registered (...) my current interest in socio-environmental issues is closely linked to NoMuos. What I am now, I also owe it to NO MUOS" (I 28 October 2020).

"From my experience in NO MUOS Gela I understood that if you want to carry on a battle, then you have to know quite well the territory (...) in this way you can better organize sabotage actions. I brought these reflections also to my experience as an activist in Gela" (I 1, March 2020).

Another recent collective mobilization that has involve not only citizens of Gela but also from other villages in the plain of Gela was the NO PEOS movement - "No ai parchi eolici off-shore (No to the Eolic Off-Shore Parks) that opposed to the 38 wind farms on the Gulf of Gela. The Mediterranean Wind offshore wind farm project to be built two nautical miles off the shore of the beach in front of the Falconara castle in the Gulf of Gela, obtained ministerial authorization on February 12, 2014. According to the NO PEOS, since still 20% of the work has not been completed, as required by law, Mediterranean Wind should request the authorizations again, as the one obtained has already expired. The NO PEOS consider the project too invasive, its realization would involve the gutting of 9.5 square kilometers of seabed, which we know to be rich in archeological finds. After three years of protests on the streets, lobbying and protest actions involving both civic society and institutions, in 2017 the hearing proved that NO PEOS was right.

NO PEOS and NO MUOS experiences confirm how it may be sometimes easier to coagulate against something that is perceived as having the potentialities of worsening the status quo, rather than around a proactive project that usually needs much more negotiations and sharing of values and common objectives.

Another collective movement, that was more explicitly “prons” instead of “cons” something, was the Movimento Pro Polo Oncologico (Pros Oncological Pole Movement) that has historically represented a victory of the civil society of Gela. Led by a doctor who fought until his death due to cancer, these movements combine actions of solidarity, with demonstrations in public spaces and action of denunciations in the press. It specifically asked the healthcare system to improve the poor services provided by the hospital of Gela to all those people having cancer. In fact, until 5-6 years ago, there was only a day hospital and there was not neither any Oncological Radiotherapy Clinic, nor any assistance to all those people who had difficulties to reach the hospital. A solidarity system of voluntary and self-organized ambulances. In order to make the pressure on the public institutions more effective, the activists have also gathered data on the amount of people having cancers and being in an in-need situation. Some initiatives that have become benchmarks in the collective memory of the citizens of Gela were the actions by some of the activists, including the ones affected by cancer, who chained themselves in front of the hospital of Gela or in other symbolic places in order to sensitize the public opinion on this theme. After years of battle, the Oncological radiotherapy was opened and dedicated to one of these activists who, in the meantime, died due to cancer. However, the services for patients are still insufficient and, above all, as I have already mentioned, there is not yet a complete scientific knowledge on the total amount of all people having cancer in Gela, with the exceptions of self-organized collection of data and not official census.

In addition to these collective battles, can be identified some more individual ones that have been capable of making an impression and changing the history of Gela. One that deserves to be mentioned is the long struggle by Emilio Giudice, an environmental activist and passionate of biology, who since the ‘80s started to ask for obtaining the official recognition of the biological relevance of the plain of Gela. Affiliated with Lega Italiana Protezione Uccelli-LIPU (Italian League for Bird Protection), thanks to years of studies, surveys and analysis, Emilio was able to involve scientists from several research centers and university in order to prove the undeniable ecological importance of the ecosystem in the plain of Gela. Through a combination of scientific research and publications and activist mobilization, part of the plain of Gela was declared a wetland of international importance recognized by the Ramsar Convention in 1991 and then an IBA- Important Bird and Biodiversity Area. In 1997 the Oriented Nature Reserve (RNO)¹⁰⁶ “Biviere di Gela” was established and since then it has played a double role of dissemination of biological characteristics of the plain through formative and didactic activities, as well as “presidium of resistance” against the different sources of contamination, from the industrial to the zootechnician ones. The reserve also hosts a visiting center in which the story of Gela is told through the lens of more-than-human communities. All the impacts on the bodies of plants and animals are emblematic examples, again, of the transcorporeality of toxicity. Notwithstanding that the reserve has

¹⁰⁶ An oriented nature reserve (R.N.O.) is a type of protected natural area in which cultural, agricultural and forestry-pastoral interventions are allowed as long as it is not in contrast with the conservation of natural environments.

gradually been recognized by the citizens as a heritage to be proud of, the solitary battle by Emilio has made this acknowledgment more conflictual and slower than it would have been in case of a more coral process.

Finally, another isolated but well-known critical position is the one local artist Giovanni Iudice. Although unfortunately it had a reduced resonance at the local level, a more striking form of denunciation, in the direction of a "narration of liberation" (Barca 2014) capable of making use of new expressive tools, is the one experienced, between 2005 and 2010, by him in a collection called Gela Methamorphosys, born, among other things, following the author's participation in some scientific conferences that reported the numbers relating to neonatal malformations in Gela [Fig. 7-9]. Iudice's testimony verbalizes the need for self-affirmation and rootedness in the commitment that derives from the rediscovery of a link with the local context, as he himself told in the course of an interview in which he revealed his feeling literally the "distillation of a territory": that's why I stayed here, because I want to be a voice (...). I am an artist with this vision of commitment" (I 9, January 2019).

The Mute Dialogue with Blind Institutions

The stories I have been through so far unearthed how the perception of health and environmental risk has been one of the triggering factors at the origin of the establishment of various territorial associative experiences which, in recent years, have clashed with the limits of a silent dialogue with the blind institutions. An example of this is the experience of the already-mentioned CTWG. It was founded in 2016, two years after the signing of the Memorandum and in the face of the peak of the sick and unemployment rate, at that stage the population began to realize that the process of conversion and elaboration of alternative development strategies for the territory was proceeding slowly and certainly in a neither transparent nor shared-with-citizen way. For these reasons, the coordination sought a dialogue with institutions, including national ones, and managed to obtain participation in various technical tables and a series of meetings with the President of the Chamber, in order to solicit the process of reconversion and direct, in a more shared way, the resources provided in response to the needs of the territory.

The co-management proposal of the pact, however, seems to have stalled, as the proposal for an online cancer census to make up for the absence of a public register of cancer patients in Gela by another territorial initiative by a group of women from Gela, FARC & C - was not followed up, as she told me ¹⁰⁷.

Having a totally different topic, but the same difficulties in achieving the final goal due to the controversies with the public institutions, is the story of ShipLab. ShipLab was born in 2014. It is the result of a Summer School organized by ENI, or more specifically by Fondazione Eni Enrico Mattei (FEEM-ENI Enrico Mattei

¹⁰⁷ In practice, it is impossible to trace the exact number of Gelesi who died from cancer, which corresponds to the specific exemption code 048. For "arbitrary or induced" reasons, other codes are in fact associated with cancer deaths; which makes a systematic analysis cumbersome.

Foundation). This foundation, daughter and sister of ENI, deals among other things with climate change, works throughout Italy, in all the cities where ENI is present. The theme of the Summer School is innovation and start-up. Some of the participants of the Summer School, about 14-15 people, found ShipLab with the idea of creating a “laboratory that navigates towards the future”¹⁰⁸. The first activities promoted by the ShipLab are training workshops on start-up innovation with the "ENI Scuola" projects.

“We had started a path that ran aground, it was called "Gulf of Myth", we had the intention of creating a small synergy of growers, entrepreneurs, gastronomic and cultural excellences for what concerns the territory, not the town of Gela, but also the territory, the territorial district, the gulf, including the plain, sea and land (..) we had begun to talk about the fishermen sector, especially from farmers, a path that then led us to a professor from the University of Catania To propose a brand of the Gulf of Myth: a brand of the territory with a specificity linked to agricultural production (...) we also presented the project at the Milan expo (...) We presented farmers with the idea of participating when a call was made to go to the bio-cluster of the Mediterranean (...) we were the promoters and facilitators of the meeting, then in the end they became fierce encounters, of complaints and recriminations. All this demotivated us a bit and, in the end, nothing came of it” (Gaetano, I 33, October 2020)

Another innovative idea that got stuck into the bureaucratic cage, in this case of the region of Sicily, regards an ecological brand for the agricultural products of the plain of Gela. Outcome of a one-year participatory path that was the object of an action-research thesis by Alessandra La Torre (2011), the brand aimed to merge together the agricultural needs with the biological one, supporting an agro-ecological way to conceive the agricultural economy. Despite some criticisms that may arise on the uncertainties regarding the contamination of some parts of the plain, the process of construction itself to reach the idea of the brand was groundbreaking. LIPU together with some environmental activists and around ten farmers signed a collective brand agreement officially grounded on the principles of agroecology and zero miles (Intesa LIPU Ente Gestore RNOBiviere di Gela – Agricoltori 2010). Once the student finished her thesis this one-year-long path did not proceed anymore, especially after the first rejection from the Sicilian region. Instead of continuing an action of pressure on the Sicilian region in order to ask it to adopt a series of directive welcoming such types of collective brands, this group who took part in the participatory path drastically reduced any further proactive action. According to Alessandra this is a story of success and failure, this latter because in her perspective

“All the responsibilities of this process were mainly on my shoulders. I was the one facilitating the dialogues between farmers and environmentalists, convening the meetings, doing research, sharing the results of this research and reformulating the feedback received during the meetings. There was not a collective distribution of the responsibility and leadership, and once I finished my thesis, I left Gela, and they were not able to carry on this project autonomously” (I 33, October 2020)

¹⁰⁸ These words come from the interview with Gaetano (I 33).

Therefore, this experience brings light to the limitations of relying an entire project on the response and learning ability of the public institutions. A similar limitation has been faced by the Gruppo Archeologico Geloï (Geloï Archeological Group - GAG) that as proposed to co-manage some of the archeological sites of Gela, especially after that in 2019 Gela has been included among the sites in which to establish the Sicilian archeological parks. The slowness of public actions made it impossible to put in practice any type of co-management, while some archeological sites are closed due to the shortage of employees.

The inability of local institutions to glimpse in these insurgent practices (Sandercock 1998) the potential for cultural and socio-economic change and innovation is not new; in fact, it has various backgrounds based on the relationship of complicity and dependence that the world of politics and work has historically established with the industrial presence. Another example of this attitude concerns the fateful question of the "refuge port" of Gela. The port of Gela has always presented a limited operation due to the reduced seabed, approximately 10 meters deep and due to the lack of infrastructure (DPR 1995). The dam protecting the wharf is damaged and the port is almost always covered in sand. Nevertheless, in the past the port was largely maintained by ENI, which carried out the various dredging operations to allow the boats to land. Since the signing of the Protocol (2014), however, the structure has been in a state of semi-abandonment, worsened by various cover-ups, temporary closures and bans on circulation with boats having a high depth. The absence of clear planning visions has prompted some social actors, who derive a living from the port, to form themselves into the Porto Rifugio Committee and the Fishermen's Association of Gela. The first is formed by a group of local entrepreneurs engaged in the management of shipyards, construction and boat repairs. The second is a committee of about 25 members made up of fishermen with varied stories behind them, as can be seen from the two testimonies reported here:

"I belong to a family in which we have been fishermen for generations (...), then for a matter of "money" I left the sea to go to the establishment, but I always had my head and passion here (...). Since the factory closed¹⁰⁹. I am always here now" (I 37 April 2021).

"I only later chose to be a fisherman, the sea was calling me (...), but I don't live by this alone, I couldn't. For others, however, the port is fundamental and is the first if not the only economic source for entire families" (I 38, April 2021).

The two committees, through combined protest strategies, media appearances and lobbying on political references, managed to turn on the lights on the long-standing question of the port, to the point of stipulating an implementation agreement for the dredging of the Port Refuge (Presidency of the Sicilian region 2016) which, through part of the ENI contributions set out in the Protocol, establishes interventions for the redevelopment, strengthening and functional restoration of the port itself. Since then, however, the various

¹⁰⁹ He is referring to the closure in 2014, when a conversion from petrochemical to green refinery has been started, at least officially (Ministro dello Sviluppo Economico et al. 2014).

individuals involved, both private, such as Eni S.p.A., Raffineria di Gela S.p.A. and Eni Mediterranea Idrocarburi, which public, such as the Sicilian Region, the Municipality of Gela, the Regional Department of Civil Protection, have not followed up on the provisions of the agreement, which has therefore "run aground". Thus, while the committees have not finished their pressing actions, the fishermen are forced to find do-it-yourself solutions to circumvent the daily problems of a silted port.

The limits in the interaction with public institutions, at various levels, are a leitmotiv of the civic history of Gelese activism and confirm the presence of particularistic behaviors and choices, to which local institutions have not been extraneous over time (Ciccarello and Nebiolo 2007). These failures have ended up reinforcing social representations aimed at defining public participation in personalistic terms, at soliciting forms of political management of the territory based on decisions taken from above, rather than on the activation of popular mobilization processes (Becucci 2004).

Organizational conflict in local society has never been incorporated into the formulation of the problem, upstream of the policies undertaken. In order to avoid or heal the conflict, the State has moved between a punitive role and a permissive, often deplorable role, which has come to include collusive forms (Di Risio 2012b). If a fragmentation, inconsistency and discontinuity of the institutional action are evident with respect to the prevention and treatment of health and environmental risk, and with respect to the relationship with the industrial activity of ENI, the interactions change in the cases in which the same issues are addressed not from the chest but in a transversal way. This is the case, for example, of the PUMS - Sustainable Mobility Plan -, approved in 2019 after several years of listening, required by law, to the stakeholders and stakeholders of civil society, as the President of FIAB Gela told me in September 2020: "We were able to sit at a table with the designers, and being the only association with this background, we already had considerable documentation on mobility projects. In the end we were mostly listened to".

As I have partly mentioned, from the immersive fieldwork, it has emerged that this attempt of dialogue between environmental activists and politicians has been full of failures. The accumulation of disappointments has motivated some of the environmentalists to flow into the novelty of the Movement Five Stars. If on one side this shift has breathed new life into the fossilized political structure, on another hand has abruptly implied the interruption of a long collective civic path:

"We started from Legambiente but then some of us created a network of associations that called us "Coordination of Sustainable Territories", and together with other associations we have done several things, including founded and managed the GAS, but also a whole series of actions, instead of it was only the local Legambiente group that made a request, instead there were 11-12 associations that together manage to have much more strength. (...) We have made environmental proposals not only linked to ENI but also for example we have joined the re-planting campaign, re-planting 1200 saplings, at our expense and that of other associations. We ran the "sustainable territories" campaign and had extended our boundaries of action to the municipalities of Niscemi and Butera. With them we brought forward a local agricultural brand of the plain,

(...) when we decided to join the movement, to take advantage of the opportunity of the candidacy in the 2015 elections, and we extended this decision to the group of Legambiente and the Coordination, c 'it was who agreed and who did not agree, who decided to join the movement left the role of leader of the association (...) who remained in associations, however, for one reason for another has no longer carried out any proposals and initiatives in the territory of Gela" (I 16 Virginia, October 2020).

Based on what has been said so far, it is clear that the interaction between the organized civic society and the public institutions has been complicated, mainly made of misunderstandings. Both the opaqueness, rigidity and backwardness of the institutions, at all levels, has implied that some requests, especially when fragmented or coming from voiceless people, were neither listened to nor supported. This amplified the already existing mistrust and skepticism toward the public institutions, as this conversation with an ex-volunteer of the Pros Oncological Movement confirms:

"The political situation has never helped us, it has never supported us in anything, not even for the opening of radiotherapy. In short, they have always put a spoke in the wheel, the institutions, the politicians (...) in the long run, let's face it frankly, you can't win against the institutions. A small group never gets it right with them" (I 13, September 2020).

At the same time, when civic organizations rely only on public institutions for achieving their goals, most of the time they fail. This is the case of the already quoted NO ENI Committee.

However, it is worth recognizing that more recently, some forms of co-planning between the world of volunteering and institutions, neighborhoods and parishes have resulted in the stipulation of a collaboration agreement for the co-management of a common good called the Iqbal Masih garden. These experiences show how the institutions, when convened, are available to sponsor specific projects, as long as they are far from issues deemed "hot", such as health and environmental issues that refer to possible causal links with the activity of the plant. The limits that can be found in such experiences lie not only in the fact of sublimating the environmental problem in the "hypo-interventions" (Tironi 2018) of daily care of spaces and public green areas, but also in not being able to create strategies capable of enabling long-term experimental and insurgent practices underway. An explanation on the shortcoming of the public institution attitude is given by the president of SMAF:

"The level of interaction with the public administration is of the type, to give you an example: the municipality needs to make a calendar of events then they call us from the secretary from the councilor and ask us "What are you doing?" then they include our initiatives in the Gelese summer calendar. For me this is neither cooperation or collaboration. This is merely the organization of events. Collaboration is commitment, sharing, it is full of seriousness. I don't feel I've ever collaborated with them. They simply call us when they need (...) Another thing would be if they involved us on some issues to work on together. This would be interesting!" (Gaetano, I 19, October 2020)

ENI: mother-stepmother

In the multi-nuanced cartography of the civic activism of Gela there is a contested zone made up of all those groups that somehow have collaborated with ENI.

An emblematic example of collaboration (someone would call it “collaborationism”¹¹⁰) is the ShipLab. Founded in 2014, ShipLab is the result of a Summer School organized by ENI, or more specifically by FEEM-ENI Enrico Mattei Foundation. This foundation, daughter and sister of ENI, deals among other things with climate change, works throughout Italy, in all the cities where ENI is present. The theme of the Summer School is innovation and start-up. Some of the participants of the Summer School, about 14-15 people, found ShipLab with the idea of creating a laboratory that navigates towards the future. The first activities go in the start-up innovation to training sector with the "ENI Scuola" projects.

“Our main interest is that of innovation. In particular, we have developed skills on start-ups. But we have tried to carry on the concept that a start-up has a degree of innovation not only from a technological point of view, but it can be innovation in the idea, in production, you can also innovate with what already exists, in fact the innovation we try to carry out with our projects is always closely linked to the territory” (Gaetano, I 33, October 2020)

One of the main projects promoted and carried out by ShipLab and thickly connected with the territory of Gela is the Gulf of Myth:

“We had started a path that ran aground, it was called "Gulf of Myth", we had the intention of creating a small synergy of growers, entrepreneurs, gastronomic and cultural excellences for what concerns the territory, not the town of Gela, but also the territory, the territorial district, the gulf, including the plain, sea and land (..) we had begun to talk about the fishermen sector, especially from farmers, a path that then led us to a professor from the University of Catania To propose a brand of the Gulf of Myth: a brand of the territory with a specificity linked to agricultural production (...) we also presented the project at the Milan expo (...) We presented farmers with the idea of participating when a call was made to go to the bio-cluster of the Mediterranean (...) we were the promoters and facilitators of the meeting, then in the end they became fierce encounters, of complaints and recriminations. All this demotivated us a bit and, in the end, nothing came of it” (Gaetano, I 33, October 2020)

Precisely because of its ambiguous relationship with ENI and FEEM, ShipLab had to face several criticisms on which both Gaetano and Alessandro do not agree:

“Inside ShipLab we faced the discussion on whether or not to collaborate with FEEM. Outside, from other groups and people there have also been some slightly unpleasant comments about our collaborative activities with FEEM (...) Even if you don't go to work directly inside the plant, I believe that there is no nothing wrong with collaborating and dealing with them. I do not understand the reason for excluding this possibility. ENI is

¹¹⁰ Collaborationism is cooperation with the enemy.

an interlocutor, we speak with ENI on the issue of compensation for the territory or to ask for more attention on some issues, so why close the door to the possibility of carrying out cultural and promotional activities together?” (Gaetano, I 33, October 2020)

“Why not take advantage of what ENI is doing for the territory today? It would be a greater loss. What has been done has been done, the petrochemical industry is like this all over the world, it's not just Gela. Now there is a crossroads. ENI is committed to renewable energy and wants to invest in our territory. Denying and not taking advantage of it in the purely economic sense would be a further loss for Gela [...] We have also asked ourselves the question, what would be the alternative? Pretend that ENI doesn't exist? Or delegate some Lombard association to do the same things? [...] My opinion is that the petrochemical is as if she were both a mother and a stepmother for Gela. But we need to take the step forward, it's up to us, it's up to everyone, to give a push towards the future, and someone has to do it regardless of the past” (Alessandra, I 33, October 2020)

Another contested experience is the project “Alle Radici del Futuro” (At the Roots of the Future). It's about an online platform envisioned for tourists and copiously financed by ENI. As it is written in the home page “Le Radici del Futuro aims at urban redevelopment starting from what the city offers that is as grandiose as it is unexplored. Protagonists? Gela and its inhabitants: institutions, schools, associations, students, young people, the elderly and professionals get involved to promote the image of the city”¹¹¹. Interestingly, in order to make the entire project more credible, it involves in first-persons several citizens who have the chance to talk about their innovative activities and visions in front of a video camera. The application of the storytelling has created an autobiographical space that has been converted in three seasons of web series, freely accessible online, but that sometimes seems to have a subtle taste of inauthenticity. This project instead of generating a sense of community cohesion, has politized even more the critical positions and opinion toward the strategies by ENI, as the following interview from Gaetano speaking about the proposal he has received by “Le Radici del Futuro” to take part in it:

“We are against ENI and that's it, we are against its way of acting which it is still having now (...) ENI is current events, it is not history. When I see the Rai-Luce television specials of the 60s and 70s, when they came to interview young people in Gela and asked them what they thought about ENI, the hopes, doubts and perplexities are the same as today (...). There were those who believed that ENI was their only salvation, there were those who instead told “I don't care about ENI”, and those who, on the other hand, sustain that ENI was a ruin and a problem for Gela because it is taking away from us the idea of a seaside city, a tourist city, city of history, etc. But unlike before, what are they just doing now? The double tease! While before they sponsored the ENI for the renewal and determination of the modern city it carried etc., now instead they tell us: "ok, it was us who took away everything you had, but now we help you to show your beauties to the whole world ",

¹¹¹ <https://www.gelalericidelfuturo.com/en/>

therefore history, archeology, cuisine etc. But go sell this hoax to someone else! Rather, they should find out what these young people are already doing in their territory and for their territory. Of everything that they (Jacopo Fo and the Roots of the Future) have talked about, we have always done it, we are doing it and we will do it. What are you going to propose to me? Among other things, you propose it to me not as a shared idea but as your own proposal, as if it were coming down from heaven. "I give you this idea so the city will be better". I don't care! I do not need it! I already do! Furthermore, not only are you getting help from "you know who" (the reference is to ENI) but in addition to that I have to look for sponsors, material, and above all citizen consent because I also have to seek citizen consent! I do not sell my face to ENI and above all the face of the young people of the group who still do not know ENI well because they are rightly growing up now, in a phase where ENI exists and does not exist and when it is ambiguous, but they do not they know the previous history well" (I 19, October 2020)

Beyond the State, Beyond ENI: toward a world of just socio-ecological alternatives

I may do agree with Alessandro De Filippo (2016: 183) when he affirms that the comprehensible diffidence of some local social actors toward both the State (and any institutions) and ENI - so dominant in the narratives about Gela that it is perceived just as a sort of public institution - can turn into an open aversion, or even a priori repulsion towards any proposal coming from the oil world, i.e. a form of primordial Manichaeism. Nonetheless, I am much more inclined and interested in alternative visions for Gela. After many years of top-down and other-directed decisions, Gela does not need to keep depending on powerful and blurry subjects, on the contrary Gela needs to take over its imagination capability for different futures. The SSS has allowed me to get close and intercept precisely all these forms of insurgent practices that embed more socio-ecological just values, being, in the meanwhile, harbingers of other possible worlds.

Up to now, in Gela, a few territorial experiments have achieved a certain success, which ignore or have relied little on public institutions and even less on ENI. This is the case of the agro-ecological experiences of Laudato Sì, Geloi Wetland and Giardino delle Belle. The first are social gardens born in 2018 from a community of people engaged in voluntary work, recently formed into a community social cooperative with the aim of offering an occupational horizon to the experience, as said by Enzo, one of the founding members:

"We have decided to make the change (...) passing from claiming to realization, from resignation to hope (...), to give a sign to the city and say that it is possible to build paths in an alternative economy (...) and aimed at caring for the common home" (I 15, October 2020).

The members of Laudato Sì try to translate into concrete action a vision, inspired by the principles of integral ecology, which - following the Encyclical of Pope Francis (Bergoglio 2015) - sees in the human being the guardian of the city and the earth. The second concern an experiment in progress in the Gela plain that has been carried out by the volunteers of Centro di Educazione Ambientale- CEA Niscemi- (Center of

Environmental Education), often also involved in LIPU, and funded by the German private foundation Stiftung Pro Artenvielfalt (Foundation Pro Biodiversity). The cultural matrix of the agro-ecology experience of Geloï Wetland, which has been underway for some years in the Gela plain, is rooted in a "project environmentalism" (Lutri 2019) inspired by the principles of deep ecology, aimed at the protection and enhancement of biodiversity, as Manuel Zaferana, co-founder of the project, biologist and passionate activist of LIPU tells me:

"We want to create different habitats that can accommodate various species of animals and at the same time cultivate some native plants, but which are always compatible with animals [...]. It is no longer man at the center, but the ecosystem. It is really a paradigm shift" (I 27, October 2020).

LIPU activists have realized that one of the crucial problems is reconciling agricultural production with respect for the ecosystem. In order to overcome a purely extractivist and industrial vision of anthropic activity, they decided to experiment with an agricultural production that respects the biological time of nature and the human species that live there which is called Gheloi, with the name of the ancient people who founded Gela. It is about 50 hectares of fields used for an agro-ecology experience, i.e. agricultural activity is organized in such a way as to accommodate animals, such as migratory birds but not only. The goal is not to have a high production but a quality production. Through this practice, this group of young people is already indicating what could be a future development path for the Gela plain that is grounded on an overall change of lifestyle as well:

"I was a NO MUOS activist for several years and I really wanted to get away from Sicily. And I did it. I lived for several years outside Sicily, in the North (...). Then my father passed away from cancer. He worked all his life in greenhouses that produced flowers. A difficult life (...) I therefore decided to return to Sicily but also to change my life. I didn't want to lead the same life my father had. Now I want to carry on this permaculture project and I am also passionate about ornithology" (WI 3, October 2020).

The Giardino delle Belle (Garden of the Beauties) is a cultivated field in Butera, a village overlooking the plain of Gela, that has been converted into a permaculture experimentation by Mario. The name calls to mind the beauties conceived as the multi-form types of plants and animals that coexist alimending the biodiversity of this place. Mario changed radical life around his 30 when, after many years having an urban, busy and competitive life and career, he understood that this was not what made him happy. After many years abroad, he returned to his family's hometown, the small village of Butera and gradually took care of the family's semi-abandoned land. I spent two days in the Giardino delle Belle, while I was helping Mario to weeding the land and prune the plants, he shared with me the difficulties, the challenges and the strengths of his experience. He is one of the co-founders of the permaculture Sicilian and Italian network promoting fair trade markets and coordinating training campus and solidarity exchanges. Nonetheless, he has met much more difficulties to spread his experience in the plain of Gela than out of it. He has weaved relationships both with the GAS of Gela and with Geloï Wetland. However, after a few times his Giardino delle Belle was burnt, most probably because of arson, he has reduced his attempt to revolutionize the local system, instead he has continued to

maintain and feed relationships with other similar realities. With his production activities he is able to be self-sufficient, this is also because most of the farming activities are carried by volunteers from everywhere in the world who, in exchange for room and board, give a hand. Actually, Mario's Giardino delle Bella is an island of agroecology and permaculture nestled in a monotonous landscape of intensive crop fields. Beyond any romanticism, instead in line with a concrete horizon of development from an ecological point of view, his experience seems to be able to recompose that lost dialogue of human-nature.

GAS Gela - Solidarity Purchase Group was born around 2009-2010 from a group of families from Gela already sensitive to environmental issues as members of Legambiente and ARCI Le Nuvole and founders of the "Sustainable Territories Coordination".

"It was a wonderful experience. Every Wednesday we met with a whole group of people, we had shifts to make boxes for each family and we did them together, between a chat and another" (I 16, October 2020)

The GAS becomes an opportunity to create a space for social interaction for more or less wealthy families who can afford this expense, but it also becomes an opportunity for discussion and sharing between different families which will be forty in moments of maximum expansion. The interesting aspect is that the GAS components decided that the products collected and distributed by the GAS had to come from companies that were at least 50 km away from Gela for safety reasons related to potential contamination.

Another recent experience is that of Sport Music Art and Folklore (SMAF) which, as its founder explains, "arises from the need to explode, to come out of the box as an association for cultural and social promotion". Founded in 2015, and made up of a board of seven people plus the president, it has about one hundred and ten associates with an average age ranging from 12-13 years up to 30 years. SMAF is characterized by carrying out some initiatives that bring together actions of mutual solidarity, with actions of territorial animation and collective care of the public space. In fact, it has already been established for several years in the historic district of Canalazzo, so called because it was the part in front of the ancient medieval walls where the waters were conveyed along, in fact, a canal. It is one of the oldest but also the most popular and degraded neighborhoods in the city. This group of young people, through self-financing actions and symbolic entrance tickets, have managed to create a social and intergenerational space where young people and inhabitants meet and collaborate to do things together. Among these, there is the organization since 2018 of the neighborhoods living nativity scene, the itinerant event for schools called CanalFood and concerning nutrition, and the end of summer week called "Art flow" during which exhibitions, musical events are intertwined, book presentations and convivial moments for lunch or dinner. It is an open and progressive group in which we move from the more spiritual themes (in fact linked to the organization of the nativity scene) to the more radical ones, at least with respect to the local and Sicilian context, such as the exhibition of a photographic exhibition on rights and the LGBT love that I got to visit. I met SMAF because I was invited to present my ongoing research in front of an audience of citizens during an evening specifically dedicated to ENI and its Greenwashing strategies. It was, most probably, one of the few places where in Gela it could be possible to talk about greenwashing.

SMAF does not have a real headquarters, but from time to time resides in abandoned or semi-abandoned houses that the owners entrust to the members of SMAF who renovate, repaint and refurbish them.

Another insurgent practice carried out during the last years in the urban center of Gela consists of a series of urban walks organized by a retired professor of history with the specific goal to re-discover hidden places and anecdotes about Gela. After I met and interviewed this professor, I did not know about these walks. He invited me with enthusiasm to take me around in some ancient backyards and secret corners. Although his account of Gela is quite an uncritical one, the practices of walking itself, as many studies affirm, become occasion to reveal stories of place and of people and recognize and valorize the material and immaterial heritage of a community. The urban walks have the potentialities to stimulate the construction and implementation of a cultural collective sense of belonging. This is the only real walking tour that is possible to do in Gela, however it is possible to do only through the spread of word and there is not any schedule and formalization of such initiatives. For sure this may be, if adequately supported, the starting point of an intergenerational project involving retired citizens and young people in urban walking tours. Those are all small data revealing the insurgent desire for regenerative transformations.

Another type of walk I had the chance to experience during my immersive experience in Gela is, again, an insurgent practice that some citizens who are passionate of both hiking and archeology carries on. I am speaking about one of the initiatives of the already mentioned Gruppo Archeologico Geloï (Geloï Archeological Group). By taking inspiration from the slow tourism, they organize a series of walks through unknown places of the plain of Gela. I spent with them an entire day during which I discovered, for instance, some Neolithic catacombs with still inside some pieces of ancient ceramic pots, a disused small mine of gypsum probably excavated during the Greek period, the legend of the giant of Manfria tower and what it is supposed to be his footprint on the ground, a pre-Greek settlement on the top of a hill [Fig. 10]. While we were crossing all these places, my guides were merging local stories with their expert knowledges. Some of them are archeologists, some are just lay passionate. Most of these places are neglected and without any touristic indications, in addition to being often full of waste that my guides patiently collected. Our exploration was made by crossing private fields and climbing hills. For us, it was possible to do this because it was a total self-organized activity without any bureaucratic limitations. However, any attempt from these activists to somehow formalize these slow touristic walks did not have any positive end.

All these experiences seem to have developed in relative autonomy with respect to the dynamics of power between work-industry-institutions that have permeated, and still permeate, the local social and productive fabric and the narration of Gela. Although on some occasions they have interacted with institutions, all these initiatives find support in private non-profit foundations, in voluntary work and in activities that procure small income from the sale of self-produced food goods. These are experiences that, in different ways, confirm how, in a phase in which the industrialization process has been progressively slowing down and then, since 2014,

to run out, new projects are emerging, not purely industrial-centric. A phenomenon that in the future deserves to be explored also in the direction of real research-action.

Decolonize the imaginaries and explore other possible worlds to engender transformative actions

“Unfortunately, many people leave [Sicily] without asking themselves, "Can I really do something to change the situation [in Sicily]?" They do not ask themselves these questions, or perhaps they are afraid to get involved or they don't believe they can actually change it” (WI 3, October 2020).

In this quite intense and long chapter I tried to tell the story of the risk landscapes of Gela through the small data I have collected thanks to the autobiographies, stories, and voices of the human and more-than-human communities. My attempt has been to trace back all those forms of insurgent knowledges that are embedded into the personal experiences of all those people who have been struggling and living together with the difficulties of unjust risk landscapes. Beyond any possible naive banalization and polarization between industry Vs socio-ecological justice, my objective has been to demonstrate that a SSS approach is able to intercept and comprehend in a deeper and more articulate way the causes of the socio-ecological transformations, as well as the possibility for a different future. The insurgent practices, more or less spread or punctual, hidden or known, are ontological examples showing that many different worlds are possible. The stories about alternative solutions beyond the industrial-centric one, allow us to decolonize the imaginaries that are at the basis of potential transformative actions.

During my immersive fieldwork I have also collected ideas for the future of Gela, some of them stem from already existing experiences, some of them are written below:

“So, what was the seafaring vocation of Gela, over time due to the infrastructure has gone extinct, many have sold, many have abandoned, others have suffered various damages due to blocked boats (...) our basic proposal is infrastructure, without infrastructure, we can't do anything. Then a further objective would be to diversify fishing activities both for a pollution issue and to allow the repopulation of the sea. We need to encourage fishermen to diversify, for example a few days a month, or for example half and half, instead of exploiting the sea or going fishing we go to collect mainly plastic, bring it ashore and so we also close the cycle of waste” (I 38, October 2020).

“We have often debated about Gela's vocation. Everyone has always referred to the industrial vocation of Gela. But the industrial vocation was a vocation induced by the other and which brought all the negative effects that we know (...) as Legambiente and environmentalists and citizens we are very clear what the future path should be: it is the agroindustry and the energy pole (...) not only for photovoltaic, wind and nano wind power, but also to expand towards biodynamic, concentrated solar power, but also plants that allow for structures dedicated to the production of components (...) therefore trigger a different industrial dynamic, perhaps also

linked to the waste cycle, not linked to incinerators and landfills (...) for us today this is the type of industry and development on which we need to focus on” (I 16, October 2020).

“In my opinion there is a certain indifference. I would use this word because I can't even blame people's passivity (...) If I hadn't had the stimulus of Andrea, my brother and the NO MUOS committee I would not have come to certain reflections. If no one stimulates you, you can have some influence, unless a relative of the chlor-soda ward dies you are unlikely to think about these things. Those who remain must think about different developments for Gela (...) There is no lack of ferments, there are ferments. Not only do I not consider Gela without future prospects, on the contrary, I think that the perspective is there, we are already within the perspective that is trying to evolve. Then everyone puts their own, in my opinion it is the responsibility of every citizen to approach the municipal administration in a process of future perspectives, but otherwise we cannot just delegate and then complain that things are not going as we would like” (I 28, October 2020).

“I wish for a Gela that fully lives its cultural sentiment but always from an innovative point of view, because living with nostalgia becomes deleterious, that in short, history is not nostalgia, but is a way to renew itself and therefore to become valuable for the city. That the return of the finds, of the ship, are welcome, but that they are and are part of an economic path that involves the whole city, involving a general cultural feeling, because obviously the first users should be us citizens of Gela (...). I hope for a Gela that can have an industrial alternative, that can resume agriculture, fishing, wine, the agricultural part, to regain possession of what we have left out because there was the dream of the petrochemical (...) tourism is our Achilles heel, my dream is that it is the strength of the city. This does not mean denying the situation of the companies present, including the metalworking ones which are a sector that still needs to be supported, but I hope for a much livelier Gela, in which to be able to move with alternative means of transport, look for another type of viability, reclaim our cultural and historical heritage, everything originates from there and I think that's what it deserves” (Gaetano, I 33, October 2020).

“I grew up with the widespread idea here in Gela according to which "either ENI or nothing". Gela, on the other hand, absolutely should not see the solution only there (in ENI) (...) Instead it should give the possibility to choose something else, to have more possibilities in their own city. This is my idea” (I 19, SMAF, October 2020).

4. DISCUSSION

4. Discussion

This chapter seeks to discuss the results of the application of the SSS approach in Gela. I will show that small data can provide a better understanding of the landscapes of risk through four lenses that allow seeing the slow and diffused transformations brought by industrial risk: memories of injustice, memories of smell, trans-corporeal stories, and relational stories. I will sustain the relevance of the specialization of SD. I will argue that the SSS approach allows unveiling and mapping both insurgent knowledges and practices that I will further systematize and classify in this chapter. I will re-elaborate the history of Gela in a timeline by means of the perspective of the activism stories. The SSS has led me to comprehend the injustices and wasted relationships shaping the risk landscapes of Gela, but also all those already existing innovative experiences questioning and envisioning socio-ecological alternatives for a different future for Gela. Finally, I will discuss the implication of small data into the action and future trajectories in Gela.

Weaving Small Data

By collecting, systematizing, and operationalizing small data, I told another, subaltern, and collective story of Gela that would have been impossible to assemble by merely referring to experts and the techno-driven ways of producing knowledge. Experimenting with the creation of new perspectives on risk landscapes allows us to scrutinize and dig into the different nuances and themes traversing those stories. In particular, we identify four crosscutting lenses that allow seeing the slow and diffused change brought by industrial risk:

- Memories of injustices. Through the point of view of an old resident or of a fisherman, we have retraced how local communities were alienated from basic common goods (Bullard 1994), such as public water and air. For instance, the gradual elimination of public fountains and the daily struggles to have running fresh water despite the enormous quantity guaranteed to the plant, are all signs of the expropriation of the common goods enacted, directly or indirectly, by the corporation. Those signs unravel the progression of expropriation and the making of a landscape of risk based on socio-environmental injustices.
- Memories of smells. Whereas in Gela the odors have not implied social mobilizations as, for instance, in the Neapolitan experience (Armiero and De Rosa 2017), the "smellscapes" (Henshaw 2014) described by some former activists of No ENI unearth the relevance of the effluvia in disclosing the metabolic relationships between environment and people and in detecting the penetration of capitalist power into the body. The toxic autobiographies reveal that the sensorial experience is the first place where people feel the oppression of contamination and capitalist power, as well as the first place where subaltern communities feel the transformation of their living landscape. This latter is consistent with the definition of landscape as "areas as perceived by people" (Council of Europe 2000: 2).
- Trans-corporeal stories. According to Stacy Alaimo, "trans-corporeality means that all creatures, as embodied beings are intermeshed with the dynamic, material world which crosses through them, transforms

them, and is transformed by them'' (Alaimo 2018: 435). The black shells lying on the beach, as well as the loss of marine flora and fauna experienced by fishermen, are both material objects that narrate a subaltern version of the effects caused by so-called progress. By embodying the notion of trans-corporeality, they not only literally reveal the porosity of human/non-human ecologies (Alaimo 2010), but they also produce new knowledge. Even stories about the experience of contamination in the human body regarding malformations, illnesses, and deaths are trans-corporeality stories. As a rich feminist scholarship has discussed extensively (Alaimo and Heckman 2012), being the middle place where matter enmeshes with politics, society, technology, and biology, bodies are compounds of flesh, elemental properties, and symbolic imaginaries (Iovino and Oppermann 2014, 6). However, experiencing the contamination in the body can also urge practices of political action and resistance. Although the politicization of the ill body (Iengo and Armiero 2017) has not been so widespread in Gela, it has been decisive for instance in inciting the formation of the CFVCS as well as in the discursive narration of the WCTG.

- **Relational stories.** Industrial capitalism and the subsequent contamination have not only affected environmental matrices and human and non-human bodies but even the relationships between them. For instance, the perception of living in harmful places makes residents much more distressed, leading them to change their relationships to their daily living places, for example, the beach and the sea in front of the city. Similarly, we have seen how first the allure of modernity brought by the factory and then the fear of contamination coming with it have changed relationships between local people and their land and its edible products. The small data and toxic autobiographies as relational stories corroborate that people dwelling in a landscape of exposure (Mitman et al. 2004) may have a holistic view of it, in which all the environmental and social elements are interconnected (Castàn Broto et al. 2007).

This categorization does not represent a rigid taxonomy; instead, all types of stories are interdependent tools from the intertwined reading of which a more complete cognitive framework regarding the riskscape of Gela emerges. Such classification also highlights how many varieties of themes and knowledge nuances can arise from small data.

The Spatialization of Small Data

I have explained how the Small Data has let me identify four crosscutting lenses through which to see and interpret the slow and diffused change brought by industrial risk. The SD has multi-qualitative dimension made of memories, stories, feelings, relations. Moreover, SD also have a spatial dimension. Just like the (in)justice is spatially reflected both in the way injustices are produced and reproduced, and in the way, justice may be achieved also through a better design and planning of the space, also small data have their own geo-reference. After all, our time is characterized by the continuous flow of huge quantities of geo-referenced big data. Different from the frenetic search for quantitative data as possible, precisely geo-referenced small data provides a not exact but exhaustive map of both the feelings, perceptions and interpretations by locals of the

socio-ecological transformations of the risk landscapes [Figure 15]. Needless to say, such a map is very partial, situated, and is somehow incremental, i.e. ontologically incomplete because it needs to be constantly fed in order to be updated. The spatialization of small data can be a revolutionary tool, especially if put in comparison with the official risk cartography grounded in expert knowledge (see chapter 3.1.). The juxtaposition (not necessarily exact from a geographic coordinate point of view) between traditional and mainstream risk cartography and the map of small data may make paradoxical mismatches and contradictions, as well may provide complementary information, or confirm the already elaborated expert knowledge maps. In all these scenarios, the spatialization of small data turns out to be an added value and above all a needed value given the lack of effectiveness of the traditional planning tools (see chapters 1.3, 3.1, and 3.2).

I recognize that such spatial representation of SD may seem incomplete, and simplistic to some extent, especially in the eyes of all those very expert GIS (nerds) and advanced spatial presentations. In this sense, I would totally agree on any criticism towards the aesthetic features of the SD map.

My rough sketch seeks to be revolutionary in its contents rather than in its poor visual representation. I do believe, as I will explain in more detail in the conclusion chapter, that interesting future follow-ups of this dissertation, may regard precisely the further developments of the spatial dimension of small data and, even more, of its impact and integration into the current risk and planning legislation. Last but not least, an additional consideration may be done on how mapping small data means to be able to map also the anomalies emerging from the schizophrenic behavior of the normalization of risk i.e., to the internalization of the contradictions of living in a toxic and degraded environment. The ambiguity regarding the uncertainties on the safety of agricultural and fishing products, despite being frequent in the daily life of each citizen of Gela, do not find any acknowledgment in the mainstream maps. In this sense, mapping small data may put on paper these small but crucial anomalies for an overall and deeper understanding of the risk landscapes.

The SSS Approach for Navigating, Mapping and Systematizing the Different Forms of Insurgent Knowledges

The SSS approach has not only led me to an introduction, operationalization, and systematization of SD in fathoming the risk landscapes but has also entailed epistemologically questioning the construction of risk knowledge in such landscapes. During the entire dissertation, I have referred to the insurgent forms of knowledges by taking inspiration from the definition of insurgent planning practices of Leonie Sandercock (2003). I conceive of the insurgent knowledges as all those forms of knowledge that come from critical thinking and their critical position relative towards the status quo. They are deeply rooted in the "local". Moreover, they are not necessarily formalized, nor acknowledged by who owns them, rather they are most often still emerging, with difficulties and in a fragmented way. In this section, I aim to substantiate the definition of insurgent knowledges by furnishing this concept with some concrete insights and features that the research experience

in Gela has provided. More in details, by scrutinizing in depth what I recounted in chapter 3.4, and simultaneously by giving attention to the way that risk knowledges emerged, I think that it is possible to recognize at least two different forms of insurgent knowledges:

- Resistant and rebel counter knowledges;
- Experiential knowledges.

In the same manner as the categories of SD, also this classification is at all not strict, rather, its purpose is bolstering to navigate and orient into the manifold forms of insurgent knowledges having, in reality, blurred bordering divides.

The resistant and rebel counter knowledges are all those forms of knowledges that are produced since the beginning with the specific intention to unmask systemic injustices, toxic narratives, and all those types of knowledge monopolization and terrorism (Shiva 2016). These types of knowledge are advocated by an individual or collective subject that decides to use counter-knowledge as one of the tools to mobilize, usually within a wider context of pressure strategies, such as live demonstrations, lobbying, judicial activism. Resistant and rebel counter-knowledges may enclose different sub-categories according to the way they are constructed and that are: popular epidemiology, citizen science, alternative expert knowledge. The first sub-category includes all those experiences of popular epidemiology that, have taken place in Gela. An example of popular epidemiology is the restless search for epidemiological data regarding the rate of diseases among the employees carried out by Aria Nuova and Amici della Terra over the last 25 years in Gela, with the secondary goals of using this data to inform the public opinion and as concrete proof during trials against ENI. Another popular epidemiological experimentation was the one conducted by FARC & C. Interestingly, they tried to democratize the collection of data by taking advantage of digital platforms and making the cancer census open to everyone who wanted to collaborate. This initiative has generated a new and counter knowledge with the twofold scope of, on a side, filling the "guilty gap" of knowledge into the expert and official surveys concerning the precise amount of people affected by cancer in Gela, and employing such counter knowledge to strengthen the advocacy/request for better hospital services for all the cancer patients. In the first example, the collection of information has been carried out mainly by activists, in the second case, the effort has been to extend the participation to the census as much as possible to everyone. Finally, a hybrid version of popular epidemiology has been the one experienced by the local group of Legambiente. It is worth noting that in this case the collection of health data had the objective to accompany the official survey proposed from the top by the IFC during an official epidemiological study. In this specific case, the construction process of a counter-knowledge has not directly affected either local struggles or produced any collective empowerment among participants, instead has influenced the personal life of the activists involved who modified their life-style, as the account by Virginia corroborates. Another sub-category of resistant and rebel counter-knowledge can be seen in experiences of citizen science conducted especially by Aria Nuova and Amici della Terra in order to collect data and prove the existence of high levels of contamination both in the soil and in the air. The direct

involvement by activists has empowered them, they have become fluent on scientific topics whose languages and tools usually belong only to experts. Also, in this case, such direct citizen science activities have been limited to a relatively small quantity of activists who without really trying to have enlarged this process to include a wider public. although these groups have been groundbreaking in the local context of Gela this latter has been almost exclusively employed during the various trials against ENI. If on one hand, delegating justice has opened a series of legal struggles that have been able to challenge the dominant position of ENI, on another hand, as previous scholars have already affirmed (Pulido 1996), searching for justice through the State -who is the first perpetrator of injustice- may reduce the effectiveness of the struggles by the social grassroots movements. As a result, the entire population of Gela has never fully embraced the battle by Aria Nuova and Amici della Terra exactly because all this effort to build up counter-knowledges has never been democratized both during the process of construction and in the political utilization of such knowledges.

Finally, the last sub-category of resistant and rebel counter-knowledges is the "alternative expert knowledge" which does not solely regard health and environmental issues, such as the two precedent ones, instead aims to convey scientific alternative knowledges to the mainstream one. In order to do it, it may call upon the support of disobedient or militant scientists (Barca 2012) who are unaligned with mainstream knowledge. An example, coming from the immersive fieldwork in Gela, is the counter-knowledge that has been assembled by Legambiente during the period of their maximum activity between 2004 and 2014. Inspired by what the activists of Legambiente Gela define as "scientific environmentalism", the reports and documents (Legambiente 2007; Nardo 2006; Legambiente 2005) display a detailed analysis of the current (at that time) situation of Gela by reworking existing scientific data into a empirical rough data. What is more, these documents indicate innovative high-technologies in alternative to the ones recommended and enforced by ENI or the State. Alternative expert knowledge is a counter-knowledge that activists formulate on purpose to propose alternatives to the mainstream choices, this is why they are written with expert language. Most of the time it is the fruits of the work of a small group of people. The strength of Legambiente Gela was their constant bid to divulge and inform this counter-knowledge to the population of Gela and the media They have also combined different attack strategies, varying from the demonstration on the street [Figure 16] to scientific conferences. Differentiating from previous forms of knowledges, Legambiente has not used this counter-knowledges as a means to denounce injustice and reveal the power dynamics, instead they use it as a way to suggest other possible forms of development that, are in line with eco-efficient ideas of development based on endless economic growth. Slightly different is the counter-scientific knowledge of both newspaper articles and a report by Andrea Turco and A Sud. Both apply the same quantitative and expert data and language by ENI, but they do this so as to unmake ENI assertiveness and unmask its greenwashing narrative strategies. The process itself a construction of this counter-knowledge has been limited to a very few people (3-4 very well-educated people) but has been then advertised and presented in several public events, of which I was an invited speaker, another one has been organized directly by me in Catania.

While the resistant and rebel counter knowledges are produced specifically with the intention to denounce injustice, to unearth toxic injustice, to support new technical proposals, it is not exactly the same for other forms of insurgent knowledges that I have recognized during my fieldwork in Gela. It is the case of experiential knowledges. As it can be easily guessed from the name I gave it, regards all those multi-nuanced forms knowledges that are embedded into the bodies and lived experiences of human and more-than-human communities. Just like the antecedent category, also in this case I identified three subcategories that follow a gradual line of meaning and that are: mundane-personal-experience-driven knowledge, trans-corporal embodied knowledges, and semiotic evidence knowledges. The first sub-category, the “mundane-personal-experience-driven knowledges”, is about all those forms of knowledges that come from the humdrum routine of living in a toxic environment. This type of knowledges can be connected to a dramatic fact of life, as well as with everyday disasters characterized by the normalization of toxicity. All this small information that uncovers the alternation of the daily relationships with the environment is part of such kind of knowledge. The fear of drinking water from the tap, the (un)consciousness search for not-local food, as well as the observations of the alternation in the sea-ecosystems by the fishermen of Licata thanks to their daily contact with the sea: all these are forms of insurgent knowledges, which would not be possible without a daily contact and experience with risk landscapes. These everyday-routine-driven knowledges are almost never put together on purpose and with the specific goal to make advocacy or lobbying activities. Instead, they are incorporated into the lived experiences of communities living on the fenceline of polluted places. Actually, it would not be easy to intercept such knowledges, unless as researchers you decide to have immersive fieldwork that embraces the SSS. Very close to these mundane experiential knowledges is another sub-category that I define as “trans-corporal embodied knowledges”. In line with a spearheading strand of feminist and revolutionary studies and epistemologies, this type of knowledge is embedded into the bodies of the human and more-than-human communities. More specifically, it arises from the sensorial embodied experience of toxicity, as for instance in the smell of rotten eggs narrated by many citizens. In addition to the sensorial embodiment, it is also experienced through the change of the body, especially through diseases, as both the account of her scared pregnancy by a mother and the story of an engineer who has worked for thirty years inside the plant attest. In this sense, my situated position as a researcher (and women?), has let me get close to a female-gendered interpretation of toxicity peculiarly through the body, the risk of disease, the care of it. This knowledge is most frequently enshrined into the personal experience of life, this is why it needs the creation of a safe space of sharing in order to come out. Furthermore, embodied knowledge can be used publicly. This is for instance the case of the CFVC, and especially of Orazio. He uses the picture of his father's sick body in order to assert a presence of a counter-knowledge that is politically alternative to the mainstream one who does not recognize a direct causal nexus between the presence of the petrochemical plant and the high rate of tumors in Gela. Similarly, the artworks by the local painter Giovanni Iudice are centered on the use of children's sick bodies to engender a visual narrative of liberation and denunciation.

Trans-corporal knowledge reveals that toxicity crosses both the human and more-than-human ecologies. It is incorporated into the more-than-human communities. Concrete examples are the alternation of the ecosystem, the increase or decrease the death of animal and plant populations. Both the mundane-experience-driven knowledge and the embodied knowledge can be captured through the use of methodological tools such as walking interviews, toxic autobiographies, toxic tours, stories of life, and participant observation. It is furthermore necessary to set up/devise a space of mutual trust, within which to gather the autobiographical self-narrating and self-reflections about daily life. As previous studies argue, autobiographies may play an important role in liberating the oppressed and establishing consciousness of their own state of subalternity. Therefore, according to my experience, being embedded into the daily personal toxic life, these knowledges need a maieutic process in order to come to the surface. In this case, the researcher takes a position of listener and facilitator for the process of sharing personal stories of life. The interpretation of both the mundane and embodied knowledges is a germane stage in the construction of knowledge. The interpretation is equally significant for the last sub-category I identified and name "semiotic evidence knowledges". Consistent with what Leonie Sandercock (2003: 79) already started to delve into, my experience in Gela has demonstrated that it is essential to pay attention to all sorts of none-verbal-evidences that are readable in symbolic forms of expression and material small signs. In addition to all those artifacts and products identified by Sandercock, such as music, paintings, poetry and theatre, I would add all those semiotic toxic signs that can be found on the black shells from the absorption of hydrocarbons, to the inescapable erosion of the dunal coast of Gela by the oppressive anthropic footprint, to the recurring presence of alert signals for bathing prohibition. This semiotic knowledge needs the SSS approach made of direct interaction and slow observation (Davies 2018, 2019). Also, these semiotic knowledges mainly emphasize a materialistic type of knowledge. However, I do believe that in addition to materialistic knowledge, there is an immaterial dimension of knowledge made of legends, discourse, and other symbolic intangible forms of knowledge.

The SSS Approach for Navigating, Mapping and Systematizing the Different Forms of Critical Positions and Insurgent Planning Practices

In the precedent examination, I pointed out how the SSS approach, through the attention and collection of SD, is able to recognize and scrutinize the manifold knowledges contained within a territory. In addition to this, the SSS has given me the possibility to trace the cartography of the varied forms of critical positions and insurgent planning practices that animate and characterize the social fabric of Gela. Depicted as socially weak, powerless, and marginalized, the social panorama of Gela seemed to be, according to the mainstream narrative, one of the causal factors of the atavistic problems of Gela. The SSS, diversely, has illuminated quite vivid situation that, despite being fragmented, conveys an alternative of the past and present story of Gela but also projects surprising potentialities for its future. Despite the perceived powerlessness and fragmentation of social capital Gela in fact contains various forms of environmentalism: from resilient to resistant, from movements

for environmental justice to "intimate environmentalism" (Tironi, 2018), from the working-class environmentalism to the movements for environmental sustainability, from embodied justice movement to institutional environmentalism. Similar to the previous attempts of taxonomy, I tried to systematize these multiform arrays of activism into categories whose borders are in reality more osmotic to each other. The identification of class is based on the different manners these groups of activists deal with socio-environmental justice within the risk landscapes of Gela. I recognized and mapped these sub-categories as follows: working-class mobilization; working-class environmentalism; sustainable and mainstream environmentalism; conflictual environmentalism looking for justice; hypo-environmentalism of the third sector; resilient and proactive practices [Figure 17].

The working-class mobilizations by trade unions have traditionally focused their efforts towards better working conditions, both from job-place security and salary point of view. The trade-union-driven mobilizations are connected with an already outdated legacy from the proletariat and sub-proletariat classes bargaining power in the face of the capitalistic owner. Yet, the recent globalization of the locations of production has weakened the bargaining power of these trade unions and their strategies. From their original role of agitator in strategies of sabotaging to unmake capitalistic power and its hold on the imagination, trade unions have turned to be the maidservant of the "movers and shakers" of industrial production, including ENI. The "Vertenza Gela" case and the pet-coke demonstration in 2002 well symbolize this inability of the trade unions to really question and bare the systematic inequalities at the basis of the monotonous industrial-centric development of Gela. The Movement of Wife, despite being "innovative" in relation to the new political role played by women, in principle follows with blind faith in the industry. Originally conceived as the unique engineer for Gela and used in order to ask for a job and better wage. In other words, the working-class organizations have not carried out any attempt of upturning the conditions of permanent dependence of the workers on the decisions by ENI. The Worker's subaltern position has worsened even more since ENI has become a multinational corporation, following the directions of profit interest that brings it to delocalize and relocate elsewhere, therefore reducing production and jobs in Gela. Only recently discussion on the potentialities of just transition, including the industrial labor sector, in a way to conciliate workers' rights with environment's rights. A more articulated opinion and more innovative position are the ones by Orazio and CFVC. While they fight for justice for workers of the chlorine-soda department, they emphasize the more general issues of environmental impacts and inequalities diffused in the risk landscapes of Gela. Similarly, the local branch of the Osservatorio Nazionale Amianto-ONA (National Observatory of the Asbestos) is struggling to obtain an acknowledgment by the plant for the extremely toxic and dangerous conditions of the workers inside. ONA activists aim to implement the right to a healthy and environmentally safe working place, with the guarantee of a job within the industry. A sensibility toward the just transition towards an ecological modernization of the system of production, based on eco-efficient and green solutions is at the core of the proposals for sustainable environmentalism, by Legambiente for a green refinery and sustainable energies.

sustainable environmentalism, while pressing on the sustainability discourse with an interest toward the working class, does not interrogate the structural dynamics of the injustice underpinning eco-efficient sustainability. Yet other types of environmentalisms have tackled the environmental issue through embracing the lens of inequalities. with an Italian peculiarity for framing environmental justice in conflictual terms (see chapter 1.4), in Gela we can recognize critical and conflictual positions, such as the ones taken by the NO ENI, NO PEOS, and NO MUOS committees, as well as those by Aria Nuova and Amici della Terra. They resolutely oppose some environmental polluters. Telling "no" has been a way to firmly and clearly disagree and reject the industrial-centric model of society. In this sense, their "no" was already telling "yes" to a different prospect for the future. All these aforementioned "no" movements assume an antagonistic position that, except for the NO PEOS, has only seldom led to a fruitful resolution by the State, the Justice System, and the ENI. Although they have the merit in struggling to uncover injustice, their battles may be easily attacked and marginalized by violent State power, toxic narratives, or other forms of slow and invisible violence. Finally, the last sub-category of practices I have recognized are those of hypo-environmentalism. It is often acted by the third sector and includes all those forms of activism that do not face the environmental issue head-on, instead they sublimate their disagreement and battle into smaller or diverse actions. Examples of this resigned environmentalism are the daily activities of care toward green. These groups employ mutualism and solidarity as a weapon against the system. They do not do this with political awareness, but their practices of collective care generate innovative spaces of sharing and caring. This is the case of FARC & C, ADOS, and also the House of Volunteering. In my perspective, the third sector in Gela is increasing in dealing with health issues, urban regeneration, social innovation in a consistent way with a more general national trend (Privitera 2021c; Privitera and Lo Re 2021). However, these hypo-interventions do not change systematically the status quo, or just in a few cases, they coin it, while most frequently they reconfirm the already existing injustices. Finally, the last type of environmentalism, is what I defined as "resilient and proactive environmentalism". It is made of all those practices and experiences that try to overcome the mainstream way of thinking. Rather, they wish to experiment with innovative socio-ecological models concentrically. This type of environmentalism is represented by the following local experience in Gela: the agro-ecological experience of Geloi Wetland [Figure 18]; the slow tourism initiatives of GAG [Figure 19] and the urban walks by a retired professor; the community garden Laudato Si; the permaculture Garden of the Beauties; the GAS initiative; the WTCG activities; SMAF. These practices embed and suggest different ways to live daily life in Gela, based, for instance, on communing, circular economy, public space care, mutualism, and socio-ecological and multispecies justice. I do believe that the lack of dialogue between all these groups that recognize the injustice perpetrated by ENI and State over time, and all the others who carry out practices and visions for a different future is a lost occasion and represents the next challenge to be achieved. If these two strains of activism would merge, this would potentially trigger a just socio-ecological transformation. In order to accomplish this, their oppositional approach should be tempered prior to negotiating their antagonist position, while the third sector should take more of a stand over its own political position (Privitera and Lo Re 2021).

Finally, I do not think that this systematization in its current sense is entirely correct and appropriate, however, I think it forms a basis upon which future work and revisions can be based. However, it already offers an alternative history of Gela through which all these critical positions, resistant and resilient practices can stake claim. Also, it can represent a starting point from which to start creating a relational field for future partnerships with local actors.

The timeline of another story of the risk landscapes of Gela

The concept of riskscapes has been used so far in the literature for intending both the geographical and spatial distribution of risk and of environmental impacts. More recently, they have been used as a theoretical-methodological tool to map the perception of risk. In this dissertation, I argued the need to enlarge the concept of risk landscapes to include all those transformations occurring in a slow and diffused way over space and time. In doing so, I emphasize not only the spatial dimension but also the temporal one. Within the literature regarding Gela, less importance has been given to the temporalization part of the transformations of the risk landscapes. By putting together gray literature, fieldwork, and official mainstream literature, in this section I will present the timeline of another story of Gela. Thanks to the SSS approach I was able to map all these critical positions and insurgent practices that enable to tell an alternative story of Gela [Figure 20]

Small Data in Action

Small data acts as tools for the production of socially engaged knowledge. It can open up new imaginations for the planning of places. All these potential guidelines for future planning can be envisioned only through the merging of corporeal storytelling and bodily and environmental legacies

The SSS approach has allowed me to foster contact with many activists. This has entailed the invitation by one of them to present my ongoing research on the 25th of September 2020. In this occasion I presented my work and I explained how I was working in constructing an alternative story of Gela starting from the stories and account of people. On that occasion, I shared an open call for collaboration [Figures 21 and 22]. I received some feedbacks and criticisms and its sharing became itself a moment to engage with a few activists, revealing how the sharing and questioning of knowledge may turn to be an engagement moment. An updated version of this timeline has become the starting point of conversations with high school teachers in Gela on the 2nd of December 2021. The presentation titled "The enhancement of local knowledge to decolonize the imagination and redesign the territories: the experience of Priolo and Gela" is part of the project of collaboration with the teachers of the High School Institute "Elio Vittorini" of Gela. So far it has established a cycle of seminars and didactic laboratories called "Memories of the future and new imaginaries: towards a shared citizenship in Sicilian late industrial territories" and developed within the interdepartmental project "REVERSE". In an

unexpected way, my presentation has generated discussions on how to further envision a partnership in which to organize these two labs, merging students, teachers, researchers and Memory Lab and Future Lab [Figure 23].

Another idea that came out of this regards the opportunity to use the funds that are designated to the remediation works for social cooperatives to manage inedible crops. All these are just ideas that can represent incredible trajectories for a different future. In this sense, the sharing of my research has been a step toward a collaborative partnership within which to decolonize the imagination. In other words, the tools of the timeline have become a foundation to share an untold story of Gela generating at the same time potential transformative ideas. The Small Data contains this In-Action feature that needs to be further explored. Precisely, how to move from “telling the right story” (Barca 2014) to “making the right planning” is the challenge.

Toward Next Trajectories

“If there is any hope of overcoming the problems (of Gela), this lies in the perspective that the people of Gela collectively place themselves as autonomous protagonists of the situation and not as passive recipients of measures from above” (Hyttén and Marchioni 1970: 8)

As I have argued throughout the preceding chapters, small data provide a counter-narrative and knowledge that challenge the mainstream ones and envisions collective imaginations for the future of the territory. From an analysis of riskscape, some methodological reflections and alternative planning trajectories for Gela have emerged.

I have argued that toxic autobiographies are crucial in the co-production of knowledge. The process of production of an alternative knowledge is the fil rouge connecting objects, bodies, and stories. According to Donna Haraway (1991: 200) bodies, human and non-human, are pivotal objects of knowledge, and we have already proved this through the stories of alterations of the material components of the landscape of Gela. The small data uncovered the “vital materiality” (Bennett 2009) running through and across human and non-human bodies, and is indispensable for CEJ studies (Pellow and Brulle 2005; Pellow 2016: 224; Pellow 2018). The interviews are also knowledge per se since the very process of gathering them produces a counter-narrative of the activists' collective history and identity (Armiero 2018: 168). By doing so, the crucial link between the production of knowledge, justice, and democracy comes into play. As several studies have demonstrated (Bremer and Meisch 2017: 12; Armitage et al. 2011; Wilder et al. 2010; Collins and Ison 2009), co-producing is bound to collective learning through situated engagement with others and through shared know-how (May and Perry 2017; Perry and Atherton 2017). The stories told by a farmer about the changes of the agro-natural productive landscapes from the effects of the industrial economy or the narration of the marine ecologies' loss experienced by fishermen deliver a form of knowledge that confirms the limitations of the current mainstream approach to risk landscapes. My research shows that contamination goes well beyond the borders of the

industrial areas declared as dangerous, enfolded environmental matrices as well as psychological and cultural ones. In this sense, the critical and in-depth reading of toxic biographies and small data so far collected gives us the possibility of understanding the limitations of the current law on risk, especially on industrial risk. Although several international institutions and scholars from different disciplines have acknowledged the connection between risk and socio-economic injustice, there are still some gaps in the European and Italian regulations. The European ones still fall short widening the range of potential public sectors actors participating in decision processes (Altiero and Dakli 2015), while the Italian law is insufficient for slow and diffused damages in contaminated territories. I argue that the planning field and Italian law need to fulfill the contents of SF and steer toward an ecosystemic and multidimensional approach to risk, that include humans as the first source of knowledge and co-designers, without ignoring the stories embodied in non-human nature. Placing the ecosystemic and multidimensional approach at the center of people's experiences and setting up a continuous process for monitoring the big and small data would feed a virtuous cycle of knowledge fostering an "enhanced procedural democracy" (Corburn 2003: 429).

Final remarks

I have explored how the SSS approach may provide a useful contribution to the planning of risk landscapes. The SSS allows the collection of small data that can be characterized by the four lens of interpretation that are: the memories of injustice; memories of smell; trans-corporeal stories; and relational stories.

I have demonstrated how small data enclosed within a spatial dimension, may be crucial in the interplay with the mainstream cartography of risk. Then I recount how the SSS approach has put me in the condition of intercepting, mapping and systematizing the forms of insurgent knowledges and of insurgent planning practices. I organized the insurgent knowledges into three main groups: resistant and rebel counter knowledges; experiential knowledges; mundane knowledges. I organized the insurgent planning practices in the following categories: working-class mobilization; working-class environmentalism; sustainable and mainstream environmentalism; conflictual environmentalism looking for justice; hypo-environmentalism of the third sector; resilient and proactive practices.

Needless to say, all small but crucial data would have been impossible to have if not through the SSS approach.

5. CONCLUSION

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This chapter will conclude my dissertation by summarizing the key findings in relation to my initial research aims and questions and discussing the value and contribution thereof. It will also review the limitations of the study and propose opportunities for future research.

“The [profound] renovation can only come from the southern populations, in which consciousness that no further delegations can be made to anyone, not even to a “democratic and anti-fascist” state such as the one promised by our constitution, matures more and more” (Hyttén and Marchion, 1970: 132)

These are the last sentences of what was at that time -and still now is- a disruptive monograph on Gela written by the two scholars and experts of the "Southern Question", Eyvind Hyttén and Marco Marchionni. The end of their work has been the starting point of my research, i.e. to understand how to search for a deep renovation better in the most distressed and marginalized areas. I tried to do it by starting from the already existing forms of knowledge and practices. How can the planning of these risk landscapes include such forms of insurgent knowledges and practices? If yes, how? My journey through disciplines, forms of knowledges, and risk landscapes of Gela has attempted to answer these research questions.

As I have anticipated in the preface, this research started with the initial idea of experimenting with the toxic autobiographies in the Sicilian context, in an area considered marginalized, in order to question how those stories could be applicable and significant in the planning field. In searching for answers to these questions, my dissertation took the shape -at least for me- of a journey full of crossings, climbs, and drops, stasis and accelerations. I crossed, or better, trespassed the disciplinary borders, I experimented with different cognitive tools, I got lost in knowledges -expert, lay, hybrid knowledges, formal and informal, punctual and diffused-, and I tried to find my way back.

I am not sure if I entirely found it, for sure I reached this point with a much more enriched stock of experiences and knowledges behind me. With that I do not want, almost naively, underscore the beauty of the immersive research in the fieldwork, neither merely make the thousandth call for a need for more trans-disciplinarity inside academia, nor (only) give a further corroboration on the added-value of self-reflexivity in acknowledging privilege and positionality while producing academic outcomes. Rather, the following final reflections on this journey aim to recapitulate and take stock of how this work can be hopefully a piece of contribution both to academia and the trans-academia world.

I think that my dissertation can provide a double contribution: an academic contribution to the academic debate; and a trans-academic contribution to both the history and literature on Gela and to the community of Gela.

With the dissertation I intended to provide the following academic contribution: a quite exhaustive and comprehensive comparative transdisciplinary literature review regarding how planning and sectoral legislation, environmental humanities, environmental justice studies, and political ecology treat the construction of risk knowledge; a re-signification of the concept of risk landscapes; the proposal of a SSS; the introduction and operationalization of SD; the follow-up development of the topic of insurgent knowledges and practices.

Below I will discuss this contribution more in-depth.

This work has been, as I say, above all a journey through several fields of knowledge with the goal of finding out the gaps into the way planning deals with the construction of knowledge of risk landscapes. Trespassing so many disciplines (see from chapter 1.1 to chapter 1.4) had the purpose of discovering the limitations and potentialities of the way varied disciplines tackle the construction of knowledge in risk landscapes, so as to understand which theories and methodologies may be borrowed and applied into the planning field. It has emerged that the theories of risk have been able to highlight different perspectives of the causes underpinning the risk. In particular I have made a comparison between ecological modernization, the treadmill of production and risk society. The treadmill of production in my perspective is a model that quite emblematically describes the capitalistic reasons, connected to continuous productions, demand, and consumption, and the environmental degradation. According to the treadmill of production, the challenge to the system must come from social disruption and political responses by social movements. The treadmill of production model is still useful to read the socio-capitalist dynamics of our current risk society, including the one going on in Gela where the choice to open, expand, and then drastically reduce, almost close and finally convert the plant into a green refinery is mostly linked to the economic market driven choices. As a matter of fact, the local choices seem to be at the mercy of sovra-local decisions connected with the socio-economic structure of our global capitalistic and extractivist society, regardless of the local community's wills. The treadmill of production, therefore, helped to frame even a local specific case, such as the one of Gela, in light of the global trend. Another risk theory I went through is the ecological modernization that lets us understand the origins of the trust given to progress better through technology as a problem and solution of the current risk, and more specifically of the industrial risk. On the contrary, my dissertation sustains that the technology, and even more the technocratic knowledge, while can provide useful tools to analyze punctual damages and predict foreseeable risks, cannot evaluate properly the diffuse damage coming from slow and spread contamination into risk landscapes. But above all, it is not able to catch the human (and more than human) dimension of knowledge. I did not insist on the dichotomy between quantitative and qualitative methods, or between hard science and soft science approaches. It would have been reductive, simplistic and banal, almost ridiculous, to just reject technological advancement and the quantitative approach to the construction of knowledge. This is not the point. The point is to understand better in the future how some technology can be at service of most distressed communities. And, from a methodological point of view, how small and big data can really become “dance partners” (Lindstrom 2016: 312). I disagree on the almost blind trust in ecological modernization as a

cause and above all a solution of the bads of our era. In doing so, many fields of knowledge, in primis the urban planning one, finds in the smart city and big data rhetoric almost the only solution in prospect. Interestingly, ecological modernization has been endorsed and acquired by the green growth rhetoric at the center of European policies with the spread of labels such as green cities, smart cities, smart transports etc. The analysis of ecological modernization, therefore, has helped me to understand how the hard science has approached risk and how this approach is interplayed with the mainstream tendencies toward an endless growth, including the green growth. The story of the petrochemical plant of Gela until its more recently announced green reconversion may be interpreted through the lens of the critique toward the ecological modernization model.

The risk society theory, differently, stresses that modernity and technology are the cause of the risk, but not necessarily the solution. What is relevant from this theory is both the boomerang effect according to which the risk is spread everywhere regardless of gender, race, etc., and the potential role of sub-political actors. The boomerang effect is at the basis of the critique by the environmental justice movements that, by contrary, emphasize how the different distributions of goods and burdens in systemic way create and reproduce inequalities. For instance, in the case of Gela, although the spatial dimension of the social inequalities is not traced according to the race or the ethnic, it takes place according to the social class divide between people working into the plant, and people working out of the plant. The first lived in a modern residential center, Villaggio Macchitella, that is located far from the plant and in front of the sea, the second live in illegal and low-quality buildings that are closer to the plant, often far from the sea and without many basic services. All people in Gela are potentially affected by the diffused damage to pollution, for instance cancer and so on, however, the possibility to access fresh and safe food is not accessible to everyone. Even more patent are the social inequalities when the issue of healthcare comes in play. As a matter of fact, everyone can be affected by tumor (especially in Gela having one of the highest rates of cancer in Italy), not all can rely on the same additional healthcare services. The case of Gela, therefore, confirms the critiques that have been moved against the risk society theory. Another reference to Ulrich Beck's work regards the potential transformative role of all the sub-political actors in tackling the current risk society. Needless to say, in the face of uncertain conditions in which both experts and politicians are not always able to face a risk situation, the sub-political can offer insightful ideas and inputs. In order to do this, the communities must be empowered and emancipated enough. When this does not happen, or happen in a discontinuous and fragmented way, as in the case of Gela, a SSS approach may create a relational field in which to put together and valorize such forms of knowledge that I have defined "insurgent", i.e. all those forms of knowledge that are local, but also not formalized, empowered, are still emerging and with difficulties.

The analysis of the rich debate and reflections regarding the relationship between expert and local/lay/vernacular knowledge has confirmed the need for a post-normal science that calls for an extended peer community. The SSS approach exactly allows the creation of extended peer communities even in these contexts in which it seems very hard to be able to create it. An extended peer community uses extended facts.

In line with it, the small data may be considered as all those extended facts that are able to catch all that information coming from human and more-than-human stories, pictures, imagines, videos, artifacts. The SSS approach puts the researcher in a listening position. SSS seeks to overcome any strict separation between expert and lay knowledge, permitting an epistemological and methodological framework that paves the way for a more collective production of knowledge, instead. This creates a stock of knowledge that integrates and sometimes turns over the expert technocratic one. In this sense, the work in Gela has absolutely confirmed how various forms of knowledges and practices may be a valuable integration of the so-far known knowledge on Gela. The toxic autobiographies and stories of injustice shed light on health issues and on the erosion of basic rights, such as water. All these stories would be stayed untold in a traditional mainstream technocratic approach.

Furthermore, the SSS approach is consistent with a strand of epistemological debate regarding environmental risk that is questioning how to better face uncertain knowledge. The SSS approach has the merit of welcoming a rich legacy coming from several disciplines, especially the legacy in the way environmental humanities, political ecology and environmental justice studies construct knowledge about risk landscapes. It borrows the attention to the systemic and capitalistic critique, including power mechanism producing injustices, from the political ecology in a way that the socio-ecological issues are read as inseparable from the political and economic ones. It also borrows attention to social justice issues. Although, in the Italian context, it is not easy (neither perhaps correct) to apply the category of injustice- that is more common in the areas where the environmental justice movements take place, such as in South and North America-, the attention to the inequalities, with reference to social class, is anyway a lens that helps to better frame both the past history, the present and the future imaginary. The SSS through the use of participant observation, walking interviews, and toxic autobiographies can map the different nuances of the social differences, and allows to link them with environmental issues. The SSS, furthermore, absorbs a part of the lively reflective and methodological tools coming from the environmental humanities. SSS especially welcomes the attention to the narrative aspects underlining the history and the presence of the place. The storytelling, which holds a privileged position in the environmental humanities, such as all the environmental history and the tradition of oral history, is also a pivotal tool into some forms of radical planning. The SSS, while it is open to all forms of storytelling in general, is in particular prone to use the toxic autobiographies that are able to merge both the epistemological challenge to co-create alternative knowledge, and the political attempt to use the narrative as a guerrilla tools for sabotaging the toxic narratives that undermine or sometimes silence the out of current voices. While human subaltern voices can speak through the environment by precisely using the narrative, the more than human communities, whose reflections can be found in the chthulucene debate and into the already vast literature review on human-more than human communities, are agencyless. Even though I do not claim that the SSS is really able to give an agency to the more-than-human communities, the conceptual tool of small data in this sense opens a window of representativeness of all those components of our ecosystem that, otherwise, would be included with difficult or, more probably, would not be included. Small data are anyway collected by

humans (researchers, planners, practitioners, etc.), however, what is important is that the SSS approach aims to break the search for big data, fast and neutral and impersonal knowledge. Instead, SSS calls for small data, slowing down, getting close in order to provide personal and partial information. SSS has, therefore, inherited this legacy. The SSS approach, in addition, has the specific intention of creating knowledges aiming to create the requisite to act into a context. This action-oriented attitude is linked to the planning that, hence, has provided some useful insights to SSS. First, in alternative to all the rationalist and modernistic approach to the planning, there is another equally consolidated branch of planning, varying from the collaborative to the advocacy planning, from the communicative to the radical, all of them, with different nuances, are characterized by their attempt to enlarge the planning process, in a way to make it more just and inclusive. While some of them have referenced more to a procedural idea of justice, some others to more substantive forms of justice. However, a strand of literature that has deeply and intensely questioned what it means to work together with communities originates from these more radical planning theories. The insurgent planning practice is an even more radical perspective, arguing and giving prominence to the several forms of knowledge. The SSS embraces the insurgent planning practices, and to it adds the ability to catch insurgent forms of knowledges. We have seen how into the planning fields the social justice debate has been central but barely interconnected with the environmental justice issues. Despite the still ongoing huge discussion about the just city, just a few are the planning works dealing also with the environment, and even less with the environmental justice movements. Two exceptions are the concept of "just sustainabilities" and "the spatial justice". The first gives room to environmental and sustainable issues, while the second to the role of civic self-organized society and grassroots movements in emphasizing the special dimension of social injustice. Being partial and situated, the SSS produces knowledge that is inevitably spatial and georeferenced. SSS precisely aims to tackle both social justice and environmental risk issues, so it is a proposal that challenges these weak points and lacks that we have recognized in the planning field. SSS, as I have widely demonstrated in chapter 3 and 4, wants to welcome the challenges launched by the more-than-human debate. It does it by proposing the conceptual tool of the small data to intercept the knowledge incorporated in animals, plants, and communities living on our planet. Finally, the SSS approach is in line with some protocols, such as Sendai Framework and Ostrava and Parma declarations that invoke the inclusion of vernacular knowledges in evaluating and mitigating risk. SSS attempts to fill an absence in our planning normative regarding risk, especially the Seveso normative in which the limits of these technocratic and merely quantitative approaches appear evident to me as they fail to read the multiple and nuanced transformations in all risk landscapes and, in particular:

- does not consider the different nature, including the perceptual and emotional sphere, of harmful events;
- it is applicable only to punctual damages, but not to those widespread in a territory, it is therefore inappropriate in cases of slow (Knowles 2014, 2018) and everyday disasters (Benadusi 2018) in which the alterations occur in a diluted and widespread manner in space making it more difficult for the inhabitants to recognize the state of vulnerability and slow violence (Nixon 2011) to which they are exposed. Besides, Seveso law introduces the concept of vulnerability as relating only to the human sphere, excluding non-human

communities which are a substantial part of ecosystems. I discussed how the laws at national, regional and local levels lack any considerations towards topics such as justice or co-production of knowledge. The SSS approach, through the stories listened and collected during the fieldwork, has brought light to the inability of these laws to valorize any forms of insurgent knowledge.

SSS has, therefore, the merit of pointing at contributing from epistemological perspective, since it refers and links together schools of thoughts that otherwise barely dialogues to each other. Namely, the complexity theory, the slow science movements with post-normal science, the situated-knowledge and the ecology of mind. SSS approach is crosscutting to all of these epistemological strands. The SSS provides an academic contribution from a methodological perspective. The SSS has indicated a possible path to be taken that may be more appropriate than technocratic or extractivism approach in order to try to sincerely interact and act together with those communities and to trigger an action-research path in a distressed fragmented context.

SSS concentrates a concrete epistemological and methodological attempt to trespass disciplines, to trespass borders of knowledge separating expert and local knowledge.

I do not claim that SSS is an already-ready package to apply everywhere, diversely, I do believe that this experience may add some insight on how the planning field (together with others) should rethink and perhaps drastically change the way to approach similar territories. Through SSS, people can be more protagonists of the landscapes' storytelling. I argue that “small” is big, “slow” is effective, and “street” is scientific.

In short, slowing down the approach both epistemologically and methodologically through what I have defined as SSS approach has allowed me to collect, systematize and valorize an alternative and complementary piece of knowledge of the risk landscapes of Gela. I have done this through a series of small data that are embedded into the stories of human and more-than-human bodies and experiences. The small data can come from a walking interview, from a toxic autobiography, from a toxic tour, from participation in a public event. Small data need to slow down, need active listening of others, need the direct immersive experience with and through others. Small data can confirm what quantitative and big data have already found, as well as can contradict what is considered an absolute truth. When these types of cognitive mismatches occur, the most enlightening new understandings probably will arise. Only through the SSS approach, I was able to intercept and map diverse forms of insurgent knowledges that may enrich the expert ones, but also question them. Some insurgent knowledges have been shaped by the expert ones. Some others have been created on purpose as a "counter-knowledge" to unveil injustice. SSS has also allowed me to engender another history of the risk landscapes of Gela that unmasks injustices perpetrated over time, but also ambiguities, and daily community's struggles.

In addition to outlining an epistemological and methodological elaboration of the SSS and experimenting with a concrete application, this dissertation provides another contribution to the academic debate that is the concept of small data. As an alternative to expert knowledge on risk landscapes built on techno-driven and big data tools, I proposed SD. Despite borrowing the term from other fields, as I have explained in chapter 2, the SD may be a “big” conceptual revolution. In fact, in an era where most of the funds and research labs

spasmodically center on the concept of big data and smart city, to recover the beauty of smallness is an act of revolution, an undisciplined act, indeed. I defined small data as the ensemble of information—we would prefer to call it "stories"—embodied into the texture of life of human and non-human communities. The differences between them, small and BD, are epistemological, “ethical,” and methodological. As a matter of fact, while BD are recurring, generalized, and impersonal, small data are discrete, specific, and personal. While BD can be collected through technological devices, small data arise through emotional and sensorial experience, i.e. fieldwork and direct interaction between the researcher and the context. I do not think that the definition and application I have provided in this research work can be considered totally exhaustive, nevertheless, I maintain that it is an original concept that deserves future attention if we really want to change our perspective of seeing, and above all, to comprehend and plan the risk landscapes. As I have scrutinized in chapter 4, SD can provide a better understanding of the landscape of risk through four lenses that allow seeing the slow and diffused change brought by industrial risk: memories of injustice; perceptive memories; trans-corporeal stories and relational stories. SD allows us to map the cartography of the insurgent and critical practices, and of the territorial anomalies. In short, SD collected during the fieldwork comprise a complex and complete cognitive framework of Gela’s risk landscapes. The data fulfils the guidelines of the Sendai Framework, the Aarhus Convention and other international documents, as residents uncovered toxic narratives centered on structural environmental injustice and co-produced knowledge that increases the empowerment and collective capabilities of local communities (Rosignoli 2018) as well as initiating them to social learning (Collins and Ison 2009), which is a key factor in the improvement of democracy and sustainability (Fischer 2017).

Furthermore, I would like to highlight how this undisciplined work at the intersection between environmental humanities, environmental justice studies, political ecology (see chapter 1.4), and planning (see chapters 1.2 and 1.3) has engendered a mutual enrichment among them, and, in particular, in the planning. The planning should debunk the more rationalists and modernist approach that mainly relies on technocratic tools to construct knowledge used for planning decisions. Consistently with what Leonie Sandercock (2003) has argued, my dissertation has attempted to demonstrate that planners should not be afraid to embrace the most different forms of knowledges and convert them into an integrated part of the planning process. My dissertation is a further proof of this call to "decolonize" the disciplined way planners use to construct knowledge. I showed that these limitations of the mainstream planning are even more patent in all those territories in which social justice issues are thickly intertwined with the ecological ones and in which violent forms of contamination occur, more or less visibly, in a gradual time span and in a diffused way in space. For this reason, I argued the need for a re-signification of the concept of risk landscapes. In particular, SSS has made me realize the necessity to expand the notion of risk landscapes toward other already existing concepts in literature, such as slow burning issues, slow and everyday disasters, slow violence. As I have explained in chapter 1.1, the term risk landscapes is everything but new. It has been so far limited in the literature to the uneven distribution of goods and burdens (Morello-Frosch and Lopez 2006) and to the mapping of risk perception by community. By stemming from a definition of landscape as a privileged conceptual tool that enables seeing the evolutionary

relationships between humans and environment, I have envisioned the landscape as a “relational field” (Micarelli and Pizziolo 1998; Micarelli 1999) in which human and non-human components interact and influence each other mutually. I argued that exploring this complex, polysemic, and conflictual ties (Pizziolo 2007: 8) is extremely productive because they expose the structure of power embodied in nature (Armiero 2008: 60): something impossible to do by using the mere quantitative and techno-driven approach to research based on BD. Grounded in this manifold definition of landscape, the risk landscapes (or riskscapes) are a privileged conceptual tool through which to read the uncertain and unjust socio-ecological relationships due to the current risk society. Specifically, this thesis provides a re-signification of industrial risk as an emblematic example of “slower-burning issues” (Mah 2017) in which forms of “slow violence” (Nixon 2011) cause “slow disasters” (Knowles 2014) and “everyday disasters” (Benadusi 2018). Industrial risk and potential damage, such as toxicity and contamination, are never locationally limited and discrete – in terms of both time and space – but always invisibly and violently diffused into human and nonhuman communities living in and shaping landscapes. In this wider interpretation, risk landscapes (or riskscapes) are indeed a privileged conceptual tool through which to read the uncertain and unjust socio-ecological relationships due to the current risk society.

Another type of contribution is the one to the local context. I think that in this regard this dissertation gives a quite valuable, although if perfectible, contribution for a series of reasons, that more in detail are: it adds to the already existing literature a piece of knowledge about an alternative and untold story of Gela and its risk landscapes; it provides a sort of space of sharing for local communities where through personal experiences they had the chance to unearth the past and present injustice and to envision other possible futures; it represents the starting point of a path of collaboration and partnership with local actors.

With regard to the contribution to the literature on Gela, it is worth noting that it is quite rich, made of several monographs, edited books, scientific peer-review articles, proceedings, but also, epidemiological reports, gray literature, newspapers, thematic magazines. More precisely, the scientific literature can be divided as follows. A strand of publications is made by semi-academic works that are fruits of research in the fields having an anthropological-sociological style. For sure, the cornerstone is “Industrializzazione senza sviluppo” (Industrialization without Development) written in 1970 by Eyvind Hytten and Marco Marchioni and mentioned several times throughout this dissertation. This is a groundbreaking analysis of the drawbacks of the first ambiguous results of a top-down modernization process aimed to highlight the discrepancy between technological progress and social development. Full of critical reflections that still look very topical for reading the reality of Gela nowadays, this book is mainly the fruit of an intense fieldwork and observation of the context. Without giving voice (at least not directly) to the residents of Gela. This book is nowadays well known in Gela. The authors depict a contradictory reality but they leave room for some optimistic hopes. Another important masterpiece in the social academic literature regarding Gela is the monograph “Spazi e Società a rischio” (Spaces and Society at Risk) written by the sociologist Pietro Saitta almost in 2009, after a short but

intense fieldwork connected with a wider project by the Italian National Health Service. The acute work of Pietro Saitta is in dialogue with the previous monograph and tells what is the legacy of the triumphalist modernization of Gela today. It depicts Gela as a place with an “intermediate development” (Saitta 2009: 70), characterized by degradation and contamination, and, at the end, with little hope left. Saitta’s work is a more collective account even if heavily guided by the specific goals of the book that were to reconstruct the industrial development and risk through the working-class perspective. Another monograph entirely dedicated to Gela is “Per una Speranza affamata” (For a Hungry Hope) by Alessandro De Filippo (2016) who, through the quite original and fascinating lens of the cine-documentaries by ENI, interprets the local story of the State-driven industrialization. Finally, there is quite vivid literature regarding the archeological Greek heritage (Brullo et al. 2010; Mulè 2016) and a local and sometimes self-produced gray literature (Esposito Paternò 2012).

My dissertation inevitably dialogues with these previous works and recognizes the benefits coming from them. However, there are some peculiarities of my work that I think make it a quite valuable added piece of knowledge on Gela. First, this monograph attempts to tell another account of the story of Gela by giving voices to those who have been voiceless so far. Through SSS, this monograph tells, for the first time, the story of Gela mainly through the eyes of residents, activists who have lived bodily all the transformation of the risk landscapes of Gela. This is an added value that cannot be found in any other publications on Gela. The purpose has been specifically to let another alternative and complementary story take shape: a story that would have not been possible to put together without a situated position and immersive fieldwork. My work reads the injustices perpetrated over time through embodied experiences of human communities, with reference to the sensorial and daily perception. It also has attempted to unveil also those trans-corporeal incorporated into the more-than-human communities. Finally, it has collected the resistant, critical, and proactive practices, both individual and collective, that are already operating a different and not-only-industrial centric vision of development for Gela. By doing so, the dissertation also includes some maps and tables that systematize both the forms of insurgent knowledges and critical and insurgent practices: these are all pieces of knowledge that cannot be found in any previous work on Gela. It is an indubitable novelty also the construction of collective timelines of the history of the risk landscapes of Gela. Particularly innovative is the history of planning from critical lenses of risk knowledge construction that reveal the inadequacy of planning in dealing with environmental-industrial risk. This type of investigation is absent in any previous work about Gela. If previous works and publications have talked about illegal urban development, in this monograph I analyze the urban policies regarding risk at several levels. My dissertation is, therefore, telling an alternative history of the past, a fresh interpretation of the current transformations, and an innovative vision that decolonizes the imaginaries (Feola 2019; Latouche 2015) for the future of Gela. Not only all these cognitive materials come from the reformulation and systematization of the small data, collected during the fieldwork, but also, differently from antecedent works, the purpose has been envisioning how those forms of insurgent knowledges can be a trailblazer to create a relational field among the social actors that are already active and struggling in Gela. In this sense, my research has been already presented during a public event in Gela on the 25th of September

2020. On that occasion, as I have explained in chapter 4, I had the chance to receive comments and criticisms that have helped me to reorient some of my research questions. In addition to this, I discussed some of my reflections during a meeting I had with a group of teachers of the scientific high school of Gela “Elio Vittorino”, within the scope of a pilot project I am carrying out together with the members of the interdepartmental project “REVERSE”. Precisely starting from the collection and potential germaneness of the memories of injustice and insurgent practices, we are envisioning together the idea of launching an annual project centered on two labs: Memory Lab and Future Lab. This ongoing path may be considered still at an embryonic stage, but emblematically says how much the SSS can in the long-term engender collaborative trans-academic processes involving both scholars and local community in achieving shared objectives. My dissertation, therefore, has the added value to put effort in the direction of what has been defined the “third mission” of the university, i.e. connected with the commitment of the university to be at the service of the territory where it is inserted: a challenge that should be even more endorsed by all those universities located in distressed areas, such as the University of Catania. A contribution indeed can be seen in this effort to intersect the first mission of making research, with the second mission of making didactic, and with the third mission regarding the university’s social commitment.

In short, -hoping not sinning of immodesty- I believe that this dissertation has been subserved both at the academic and trans-academic levels. Notwithstanding, in my opinion, some weaknesses or critical points can be recognized. For instance, the main limitation of this research is that it loudly calls for a grounded immersive way to construct knowledge, while both my fieldwork and the modality to experience it have been trapped by all the restrictions coming from the Covid-19 global pandemic. I spent time in Gela between October 2018 and January 2019, as well as between April and June 2021. However, I had to reduce the planned continuous fieldwork due to the long lockdown, by reducing it from three months to one month between September and October 2020. In addition to this, the active participation in public events, participant observation, the snowball effect, all these public activities have been widely affected by the Covid-19. I was lucky enough to have the chance, in any case, to meet people in person. Nevertheless, we were often obliged to keep the social distance between us, as well as to wear masks, and, above all, it was patent the general feeling of anxiety that has strongly compromised the creation of spontaneous convivial moments. While the academic activities were totally blocked from March to September 2020, then again from November to March 2021, the deadline to present the dissertation has been extended by only three months. Considering that the Italian academic system already imposes a three-year Ph.D. program - that is a quite short span of time, especially with respect to other international contexts in which I have the luck to spend some periods of visiting such as Sweden and the US-, it becomes even more clear how the Covid-19 has worsened the situation. I am telling nothing new, but the mismatch between what was initially planned and what actually occurred due to obtuse bureaucracy has meant drastic and radical changes, impacting the beauty of serendipity. In other words, and paradoxically, the deadlines and rigid restrictions were running after me, while I was epistemologically arguing that academia should slow down. Because of this, I had fewer concrete possibilities to put into practice what I have

theoretically developed in regard to the potentialities of SSS for spawning emancipatory knowledges and collaborative moments into the frame of community-engaged research. Finally, another shortcoming regards the possibility to use the small data inside in mainstream planning. This would have entailed more time to make practical proposals to the decision-makers.

These shortcomings have allowed me to indicate which could be the future challenges to endorse.

A first crucial future development concerns the need for methodologically strengthening the small slow street approach. As both my supervisors and reviewers have properly pointed out, while the epistemological turn and background seem quite articulated and clear, the methodological added-value may be something to further elaborate. For sure, a practical challenge is how to better investigate how all these insurgent knowledges and practices may be included and fit also into institutional frames and policies. The challenge would be to understand which hybrid spaces can be found inside the institutional and mainstream planning to allow the integration of small data, and more in general, to welcome innovative epistemological and methodological proposals such as the SSS.

Another follow-up initiative for the future may be to experiment with the potential of small data for constructing emancipatory knowledge, i.e. knowledges that empower people to take over a more central role in the planning process. In this sense, I personally feel to have an important responsibility in making the contents of my research available to the community of Gela as much as possible. For instance, once I shared a scientific paper written in English in a peer-reviews indexed journal (Privitera et al. 2021) with some activists, one of them tell me “Wow thank you, it looks amazing, it is a pity that it is written in English because otherwise, I am sure I would appreciate it!”. Since then, I decided to publish four more articles in Italian on purpose (Privitera 2021a; Privitera 2021b; Morpugno et al. forthcoming; Armiero et al. forthcoming). Beyond the academic production, my goal is to create moments of dialogue and confrontation around my research questions and findings with the idea to publish a popular book, similarly to other previous experiences, such as the collective book edited by Marco Armiero (2014) with a group of women activists in the land of fires in Campania; the community publication edited by Laura Saija (2011) and concerning the struggle in the Simeto Valley in Sicily. The upcoming idea would be creating partnerships with the territorial local actors. One of these partnerships is already ongoing within the project REVERSE about which I already talked.

My sincere, almost naïve desire, is that the scholars and planners may really play a crucial role to achieve more social and environmental justice. My hope is that this dissertation may be a step in this direction.

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Appendix A

Filmography (partly from De Filippo 2016)

Giornale Luce B1596 (1938) L'inizio dei lavori per la costruzione della diga di Gela, (04/10/1939)

Giuseppe Scotese (1958) Archeologia + petrolio – Sicilia 1958

Romano Sileoni (1959) Terra di Gela, Istituto Luce

Vittorio De Seta and Franco Dodi (1960) Gela 1959: pozzi a mare

Ferdinando Cerchio (1960) A Gela qualcosa di nuovo

Paolo e Vittorio Taviani (1960). Appuntamento a Gela. In: Joris Ivens (film director), L'Italia non è un paese povero

Giacomo Vaccari (1961) Ritratto di una grande impresa

Gilbert Bovay (1962) Morte d'un condottiere

Giuseppe Ferrara (1962) Minatore di zolfara

Gian Maria Messeni (1962) L'isola del petrolio

Giuseppe Ferrara (1963) Le streghe a Pachino

Gianfranco Mingozzi (1963) Li mali mestieri

Giuseppe Ferrara (1964) Gela antica e nuova

Giuseppe Ferrara (1964) Il gigante di Gela

Giuseppe Ferrara (1964) La cena di San Giuseppe

Piero Nelli (1965) Green Light

Gilbert Bovay (1965) Gli uomini del petrolio

Gianfranco Mingozzi (1965) Con il cuore fermo, Sicilia

Gilbert Bovay (1968) Africa. Nascita di un continente

Sergio Zavoli (1968) Ricordo di Enrico Mattei

Bernardo Bertolucci (1968) La via del Petrolio

Folco Quilici (1970) L'Italia vista dal cielo

Gillo Pontecorvo (1984) Una storia per l'energia

Paolo e Vittorio Taviani e Valentino Orsini (1986) *I cam 300 giorni*

Stefano Missio (1997) *Quando l'Italia non era un Paese povero*

Daniele Vicari (2006) *Il mio Paese*

Archivio Storico ENI (2010) *ENI, si gira*

Appendix B

List of Acronyms

ADOCES: Associazione Donatori Cellulare Staminali Emopoietiche e Sangue Cordonale (Association of hematopoietic stem cell and cord blood donors)

ADOS: Associazione Donne Operate al Seno (Association of the Women who were Operated to the Breast)

AGIP: Azienda Generale Italiana Petroli (General Italian Oil Company)

AIA: Autorizzazione Integrata Ambientale (Integrated Environmental Authorization)

ANIC: Azienda Nazionale Idrogenazione Combustibili (National Fuel Hydrogenation Company)

ARPA: Agenzia regionale per la ricerca e la prevenzione ambientale (Regional Agency for the research and the environmental prevention)

BD: Big Data

CEA: Centro di Educazione Ambientale (Center of Environmental Education)

CEJ: Critical Environmental Justice

CFVC: Committee Families of the Victims of Chlorine Soda

EH: Environmental Humanities

EIF: Environmental Inequality Formation

EJ: Environmental Justice

ENI: Ente Nazionale Idrocarburi (National Hydrocarbons Authority)

EU: European Union

FARC & C: Fusing together Cancer Research Assistance & Culture

FEEM: Fondazione ENI Enrico Mattei (ENI Enrico Mattei Foundation)

FIAB: Italian Federation of the Environment and Bicycle

GAG: Gruppo Archeologico Geloi (Geloi Archeological Group)

GAS: Gruppo di Acquisto Solidale (Ethical purchasing group)

IBA: Important Bird Areas

ICSHNet: European Industrially Contaminated Sites and Health Network

IFC: Istituto di Fisiologia Clinica (Institute of Clinical Physiology)

ISAF: Industria Siciliana Acido Fosforico (Sicilian Industry Phosphoric Acid).

ISPRA: Istituto Superiore per la Protezione e la Ricerca Ambientale (the Italian National Institute for Environmental Protection and Research)

LIPU: Lega italiana protezione uccelli (Italian League for Bird Protection)

MATM: Ministero dell'Ambiente e della Tutela del Territorio e del Mare (Italy Ministry of the Environment and Protection of Land and Sea)

NO MUOS: No Mobile User Objective System

NO PEOS: No ai Parchi Eolici Off-Shore (No to the Eolic Off-Shore Parks)

NO TRIV: No Trivellazioni (No Drillings)

ONA: Osservatorio Nazionale Amianto (National Observatory of the Asbestos)

PE: Political Ecology

PRG: Piano Regolatore Generale (General Regulatory Plan that coincides with the town plan or local strategic plan enforced by the local government)

REVERSE: Responsible research, VERSatile Knowledge, Environmental futures in action

RNO: Riserva naturale orientata (Oriented nature reserve)

RSIN: Remediation Site of National Interest

SD: Small Data

SCI: Site of Community Importance

SENTIERI: National Epidemiological Study of Territories and Settlements Exposed to Pollution Risk

SF: Sendai Framework

SMAF: Sport Music Art and Folklore

SPA: Special Protection Area

SSS: Small Slow Street (approach)

WCTG: Coordination of Women for the Territory of Gela

Appendix C

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Figure 2: Map of RSINs (translated from Italian to English by the author). Source: http://www.isprambiente.gov.it/files2017/temi/siti-contaminati/LocalizzazioneesuperficieSIN_rev_aprile_2019.pdf.

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Figure 8: The blueprint of the PRG approved in 1971. It presents the traditional urban zoning that do not take into consideration the illegal urban development of those years. Source: by courtesy of Giacomo Cascino who is employed at the urban department of the Municipality of Gela.

Figure 9: A field of greenhouses extends from the inner part of the plain to the coast. Source: photo by Elisa Privitera, January 2019.

Figure 10: Endless intensive crops in the plain of Gela. Source: photo by Elisa Privitera, January 2019.

Figure 11: Erosion of the dunal coast on the east part of Gela, close to the industrial plant and to the intensive crop fields. Source: photo by Elisa Privitera, October 2020.

Figure 12: Degraded infrastructure on the east coast of Gela. It was realized in order to reduce the erosion of the coast, it has failed its objective, instead it has increased the erosion process. Source: photo by Elisa Privitera, October 2020.

Figure 13: One of the many signs forbidding any bath. Source: photo by Elisa Privitera, October 2020.

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Figure 15: The spatialization of map. Source: by the author.

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<https://www.quotidianodigela.it/legambiente-e-i-bambini-ripuliscono-il-giardino-dell-acropoli-ma-i-residenti-si-ribellano-tocca-al-comune/>

Figure 17: From SSS to Small Data: a general overview. Source: by the author.

Figure 18: Walking interview with one of the members of Gelo Wetland. Source: by the author.

Figure 19: Slow walk together with the members of GAG. Source: photo by Elisa Privitera

Figure 20: Excerpt of the timeline I showed during the public event (a final version including the feedbacks I received and the new knowledge from my work is still in progress). Source: by the author.

Figure 21: Event of presentation of the PhD ongoing research during a public event organized by SMAF. Source: by courtesy of SMAF.

Figure 22: Event of presentation of the PhD ongoing research during a public event organized by SMAF. Source: by courtesy of SMAF.

Figure 23: Screenshot during the meeting with the teachers of the high school of Gela. Source: by the author.

Tables

Table 1: The epistemological and methodological differences between small and big data approach to the production of knowledge on risk landscapes. Elaborated by the author.

Table 2: List of the interviewees. Elaborated by the author.

Appendix D

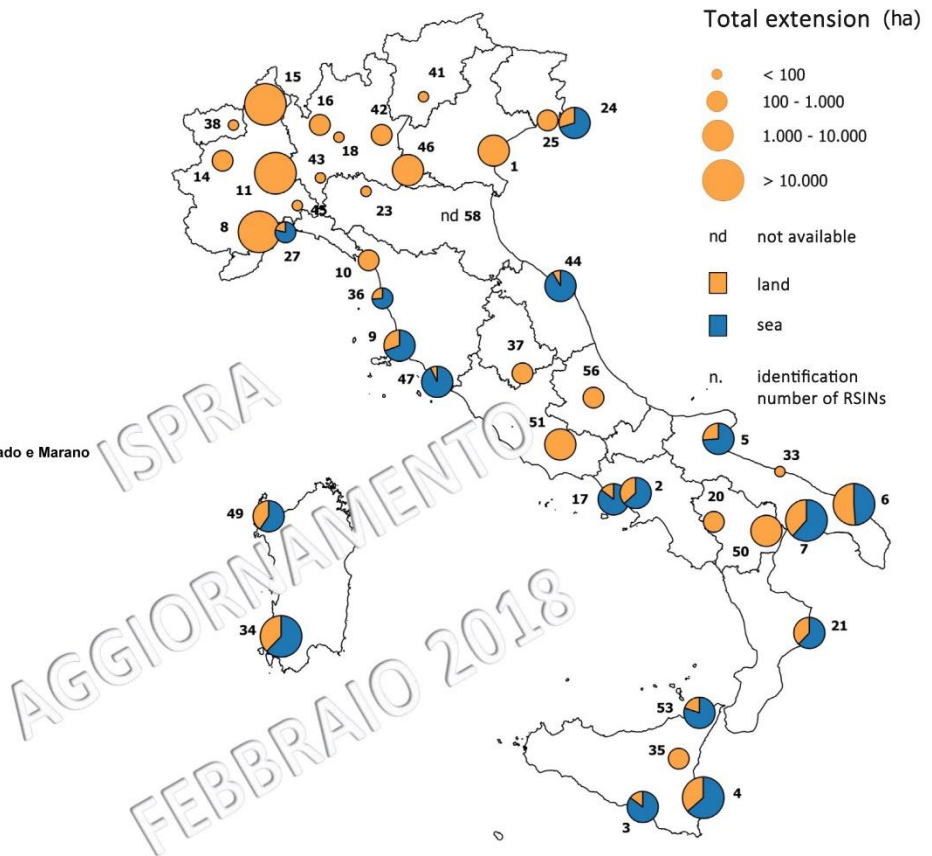
Figures



Figure 1

List of RSINs- Remediation Sites of National Interest

- 1 Venezia (Porto Marghera)
- 2 Napoli Orientale
- 3 Gela
- 4 Priolo
- 5 Manfredonia
- 6 Brindisi
- 7 Taranto
- 8 Cengio e Saliceto
- 9 Piombino
- 10 Massa e Carrara
- 11 Casal Monferrato
- 14 Balangero
- 15 Pieve Vergonte
- 16 Sesto San Giovanni
- 17 Napoli Bagnoli – Coroglio
- 18 Pioltello – Rodano
- 20 Tito
- 21 Crotone – Cassano – Cerchiara
- 23 Fidenza
- 24 Trieste
- 25 Caffaro di Torviscosa (*già* Laguna di Grado e Marano)
- 27 Cogoleto - Stoppani
- 33 Bari - Fibronit
- 34 Sulcis – Iglesiente – Guspinese
- 35 Biancavilla
- 36 Livorno
- 37 Terni - Papigno
- 38 Emares
- 41 Trento nord
- 42 Brescia – Caffaro
- 43 Broni
- 44 Falconara Marittima
- 45 Serravalle Scrivia
- 46 Laghi di Mantova e Polo chimico
- 47 Orbetello Area ex-Sitoco
- 49 Aree industriali di Porto Torres
- 50 Aree industriali della Val Basento
- 51 Bacino del Fiume Sacco
- 53 Milazzo
- 56 Bussi sul Tirino
- 58 Officina Grande Riparazione ETR di Bologna



* Translation of oblique white writing: ISPRA (the Italian Institute for Environmental Protection and Research); Aggiornamento (Updates); Febbraio 2018 (February 2018).

Figure 2

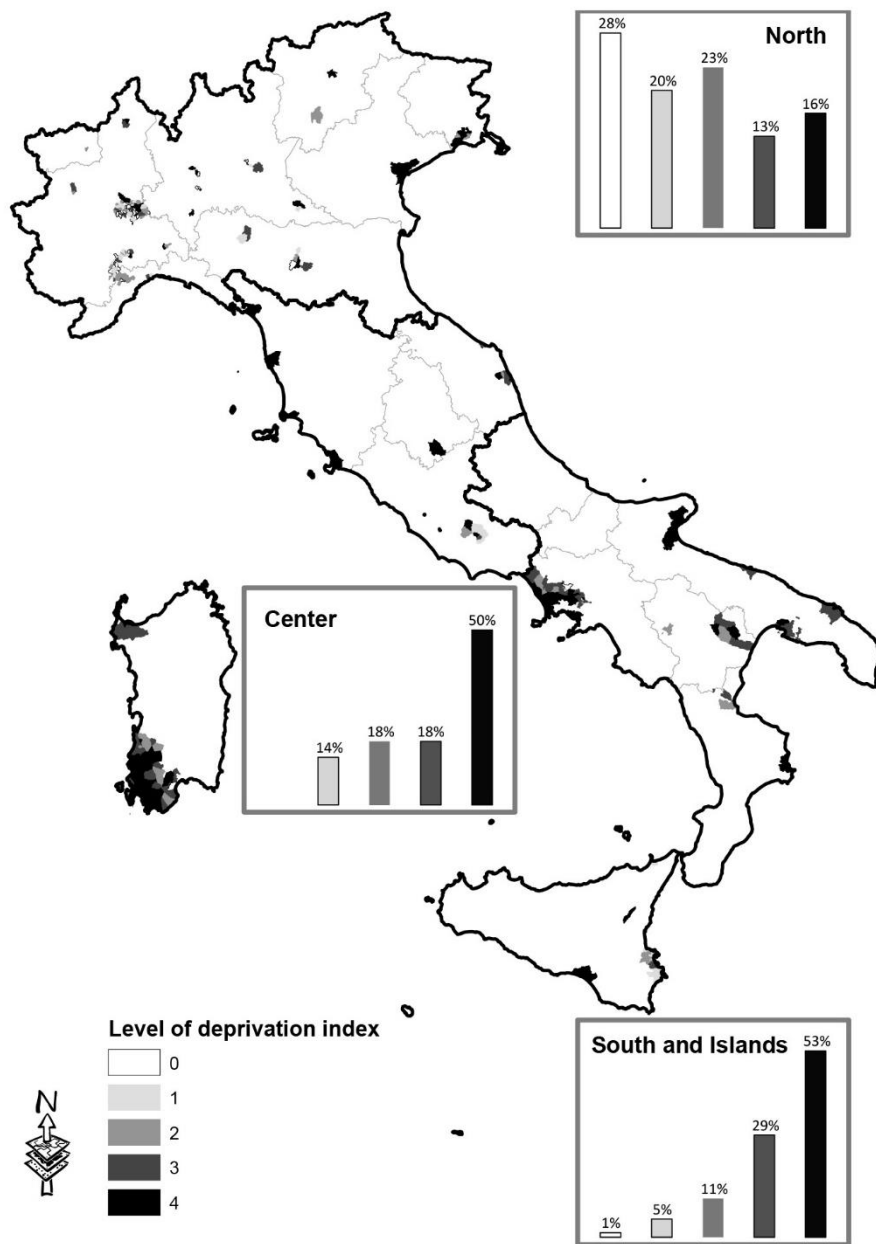


Figure 3

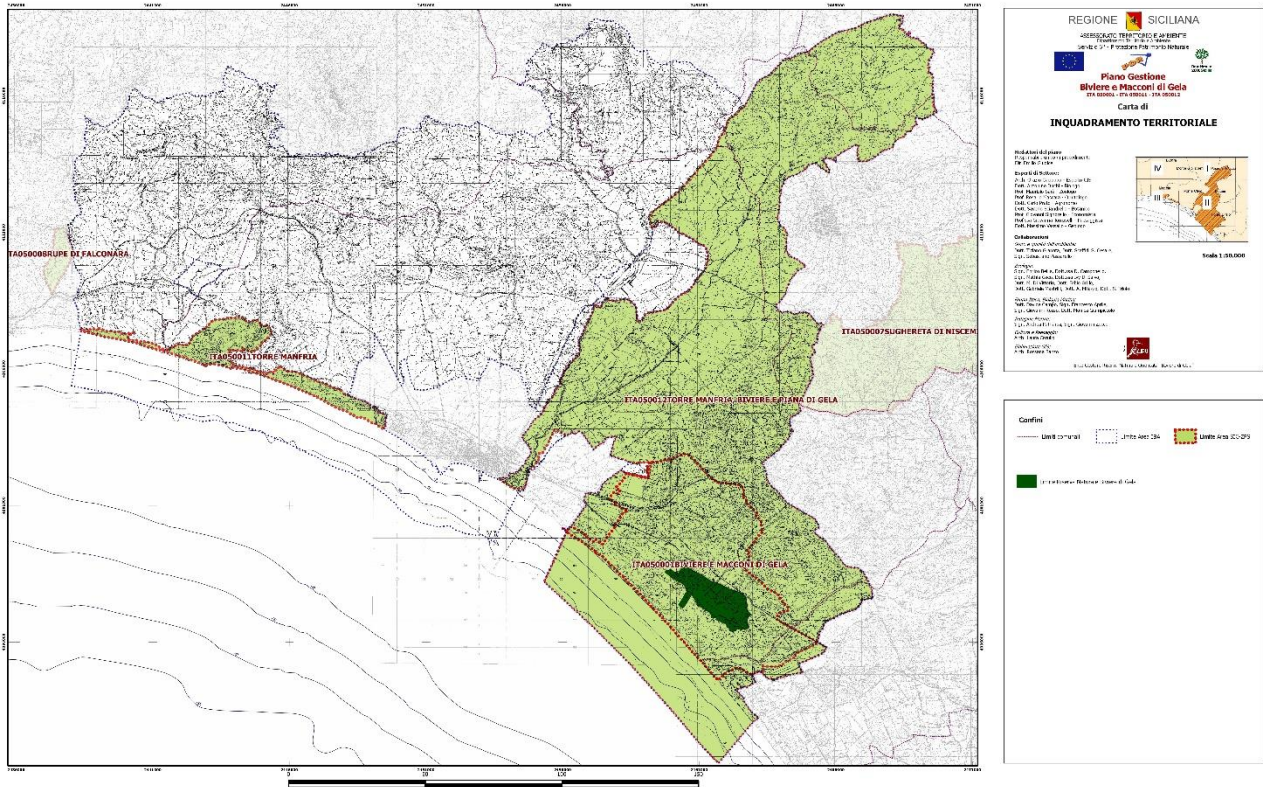


Figure 4

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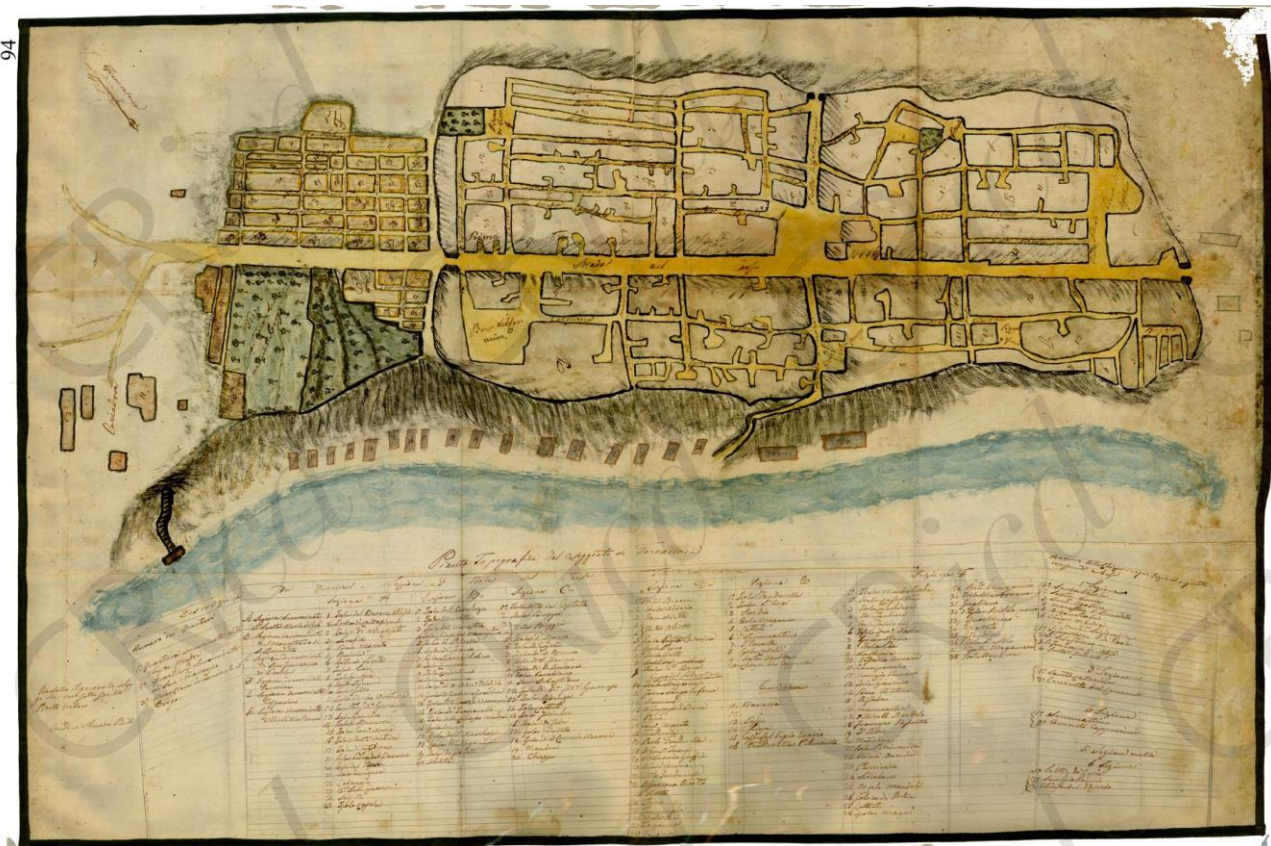


Figure 5



Figure 6



Figure 7



Figure 10



Figure 11



Figure 12



Figure 13



Figure 14

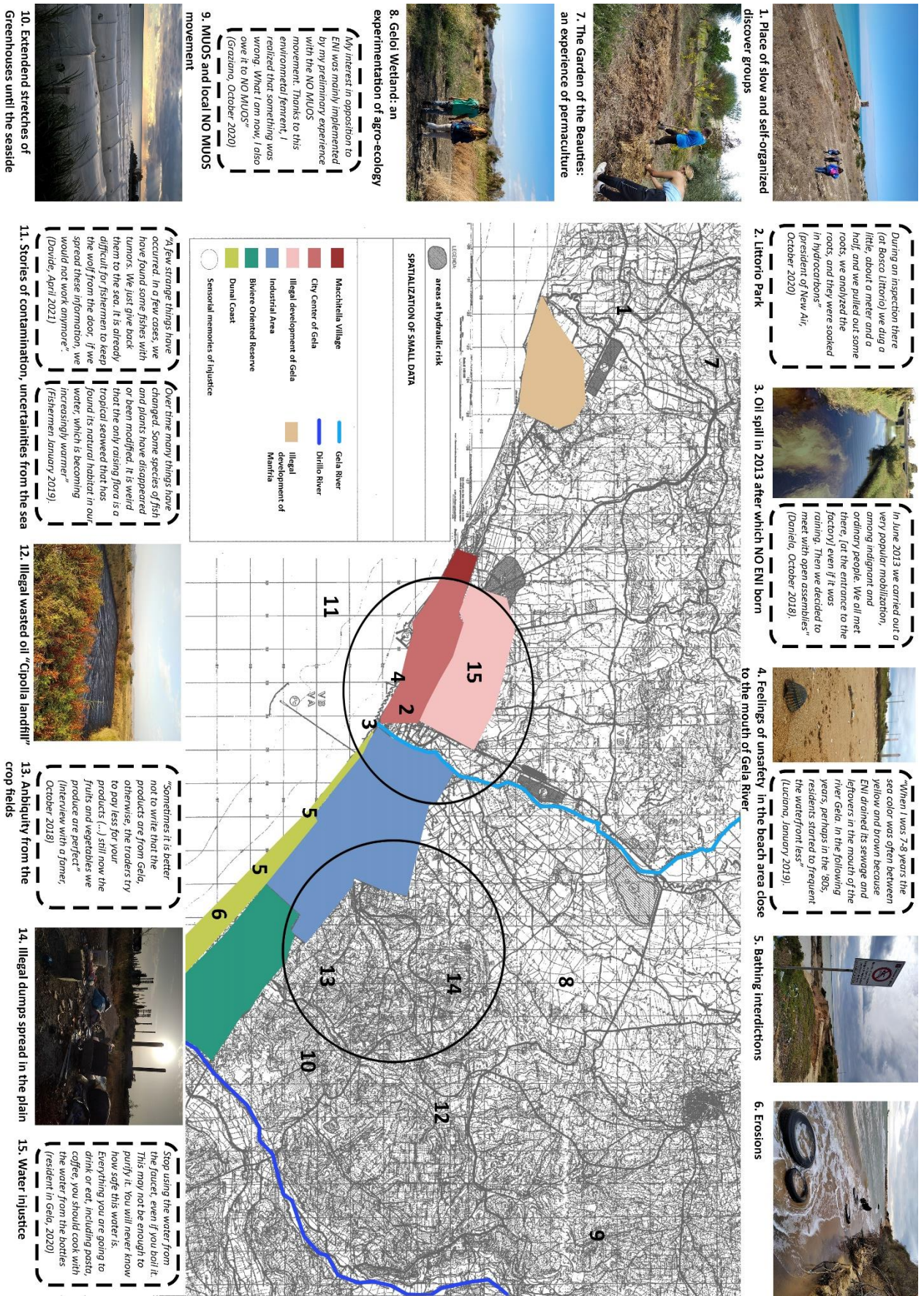


Figure 15



Figure 16

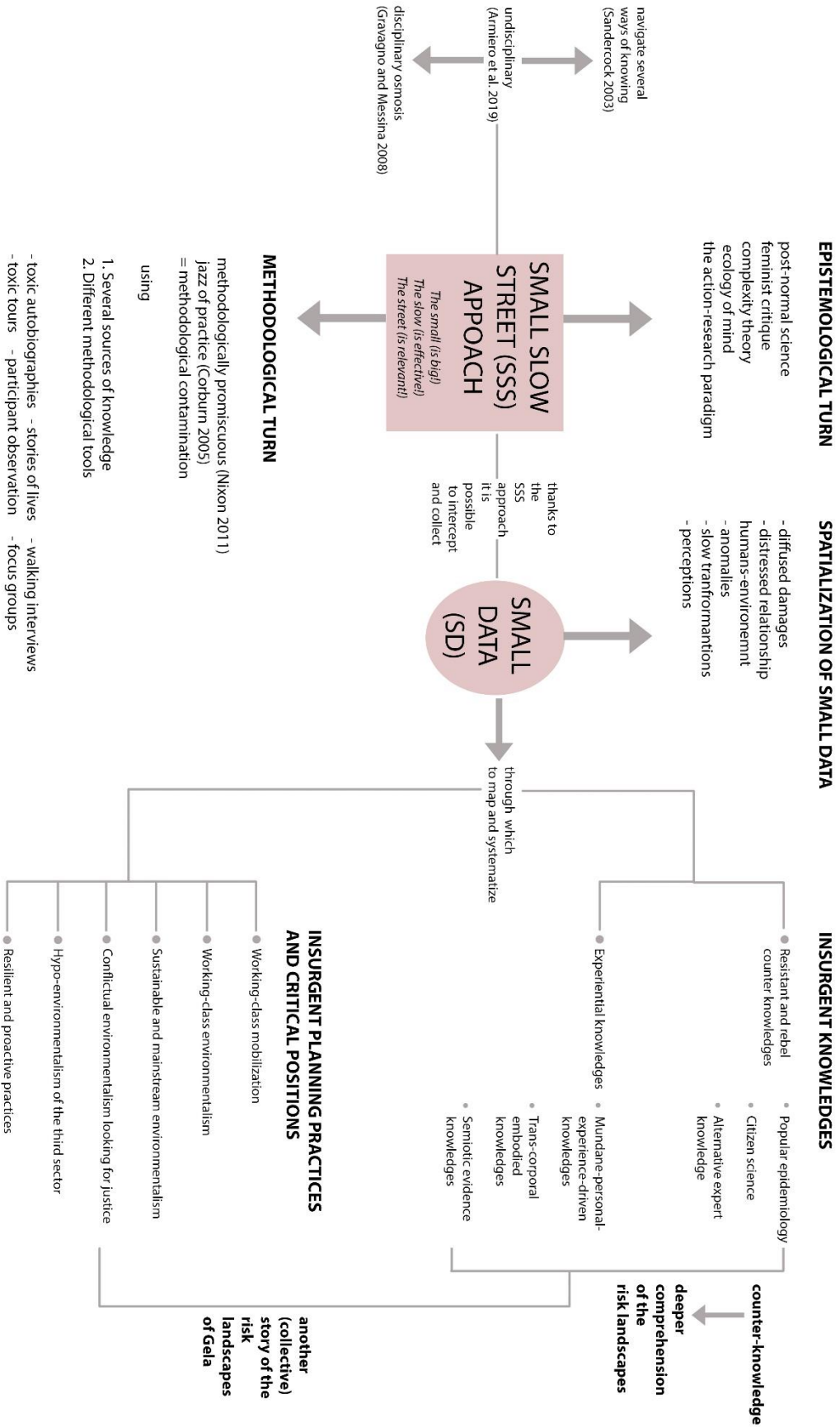


Figure 17

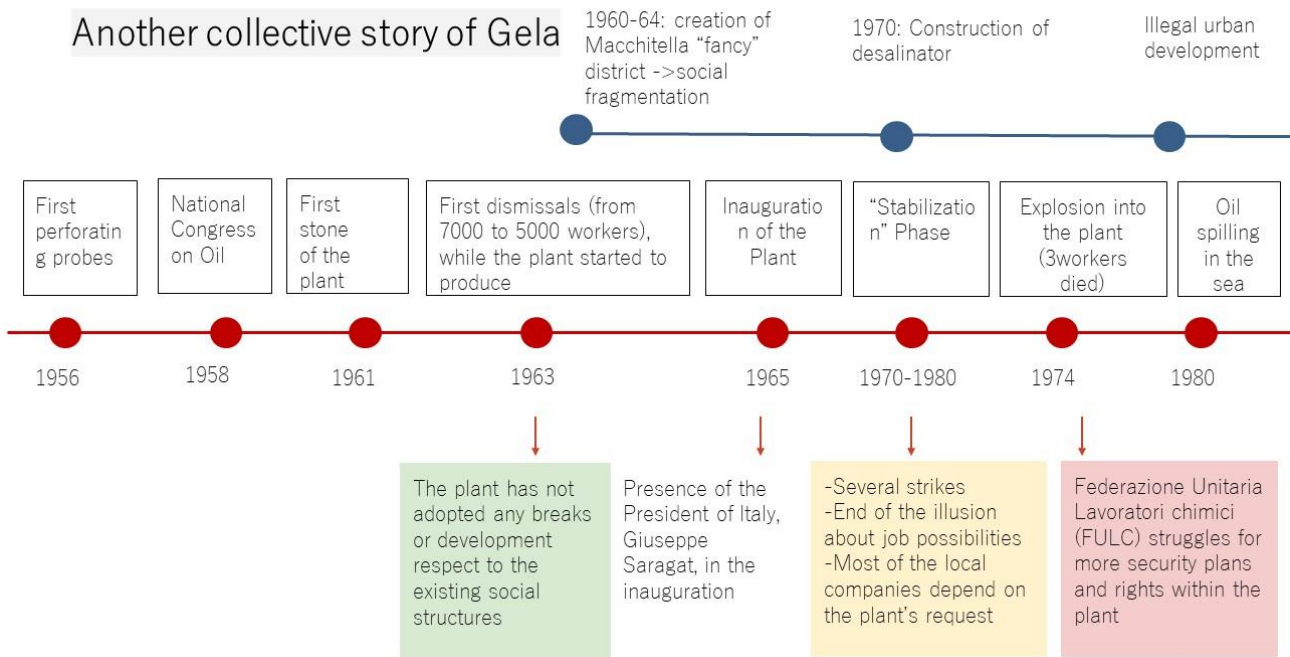


Figure 18

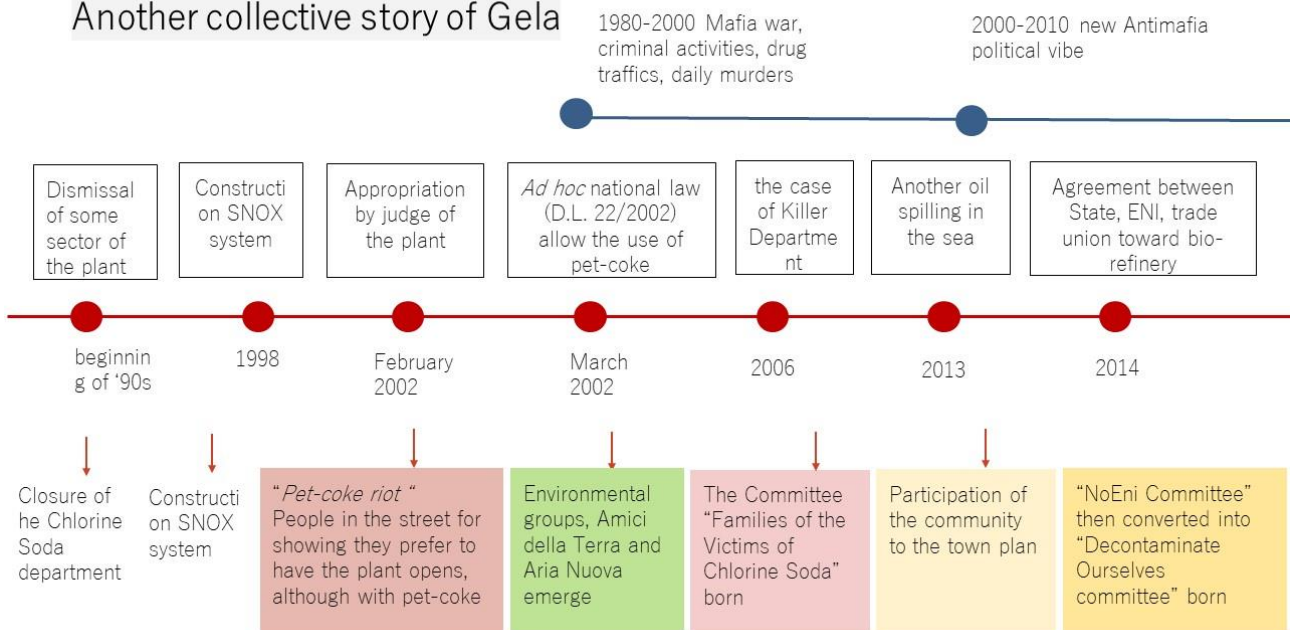


Figure 19

Another collective story of Gela



Another collective story of Gela



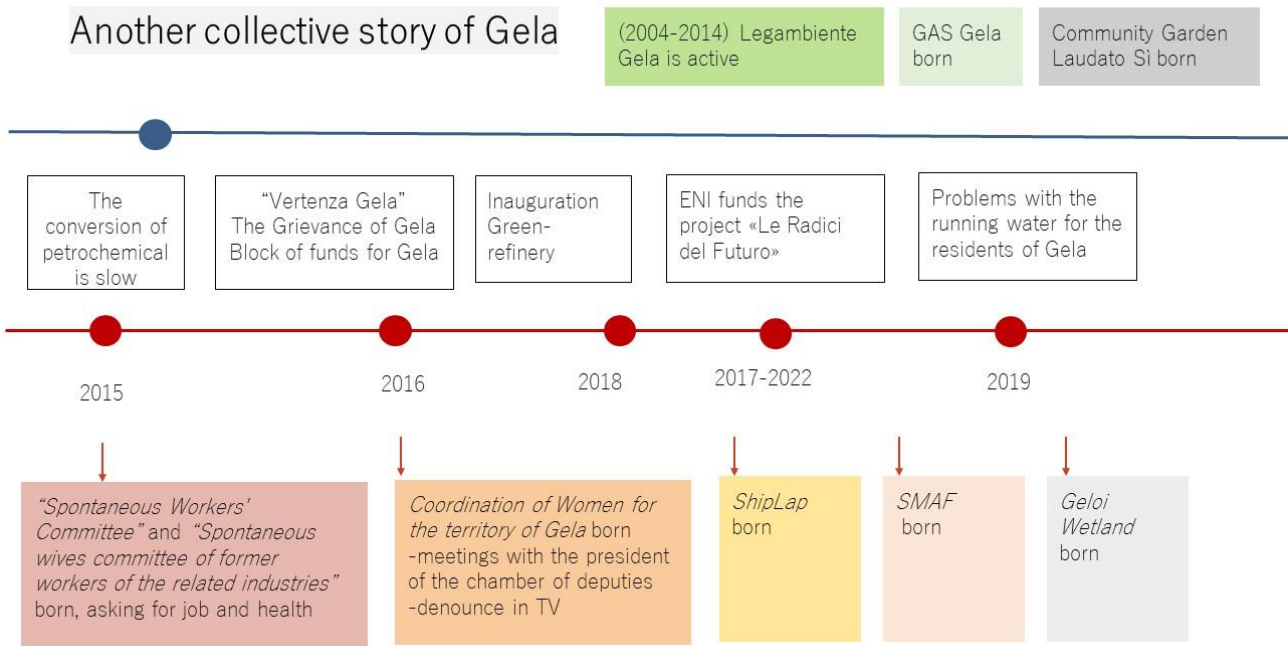


Figure 20



Figure 21



Figure 22

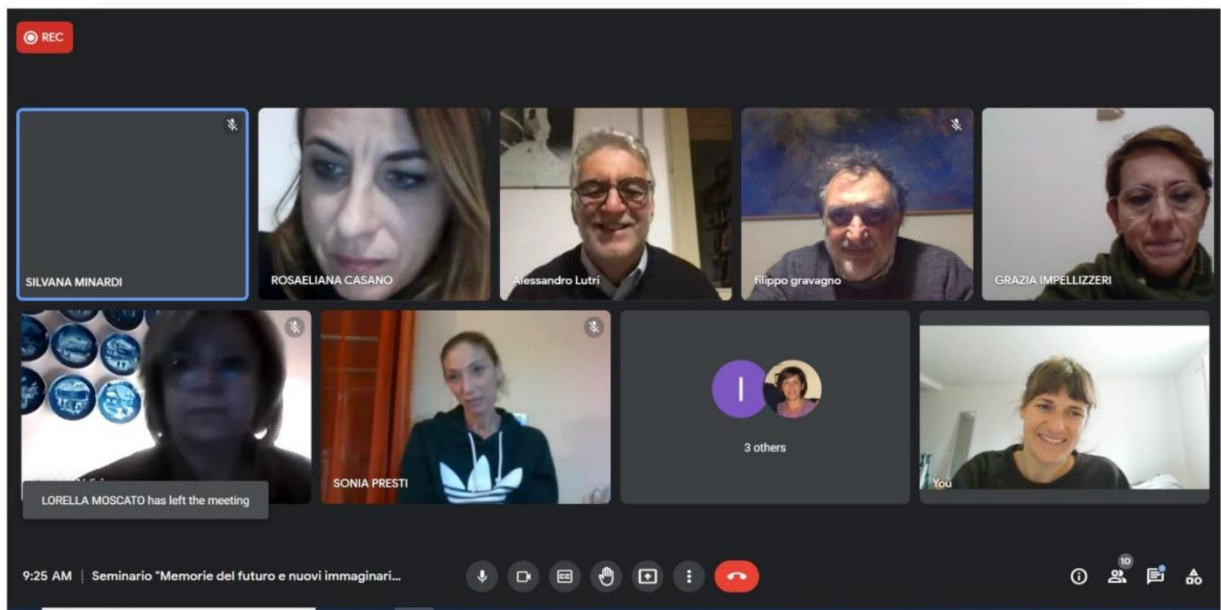


Figure 23

	“Mainstream and Techno-Driven” approach to the production of expert knowledge on risk landscapes	“Small-Slow-Street” approach to the production of diffused knowledge on risk landscapes
Epistemological approach to knowledge	Gap between expert and lay knowledge (Model 1 as in Callon 1999)	Bridge the gap between expert and lay-local- vernacular knowledge (Model 3 as in Callon 1999; Corburn 2003) toward an extended peer community (Funtowicz&Ravetz 1992)
Social theory of risk	Ecological modernisation as a way to resolve environmental problems induced by modernity	Risk society (Beck 1992) cannot be resolved by improving technology and systems of industrial society, rather sub-political actors can democratize science
How to address risk	Through technological innovation	Through social and democratic innovation
Outcomes	Black box effect (Latour, 1999)	Transparency, co-production of knowledge, street and open science
Tools and their features	Big data and quantitative tools are recurring, generalized, and impersonal and collected through technological devices	Small data and toxic autobiographies (Armiero et al. 2019) are discrete, specific, and personal, arising through emotional and sensorial experience, i.e. fieldwork and direct interaction between the researcher and the context
Definition of environmental risk	Predictable, punctual, quantifiable phenomena	Unpredictable, diffused, slow, and unquantifiable phenomena
Definition of risk landscapes	Risk landscapes as sudden and abrupt disasters	Risk landscapes as slow-burning issues and slow disasters

Table 1

Table 2

I	IN-DEPTH INTERVIEW / HERMENEUTIC INTERVIEWS / TOXIC AUTOBIOGRAPHIES	WHEN
1	Andrea Turco, local journalist, ex-member of "NO ENI Committee" and co-founder of the Sicilian branch of the non-profit organization "A Sud"	October, 2018 November, 2018 September-October 2020 March-April 2021
2	Daniela, ex-member of "NO ENI Committee"	October, 2018
3	Resident with relatives working for the plant	October, 2018
4	Engineer working for the plant since more than 30 years	December, 2018
5	Historical resident, retired professor	January, 2019
6	Emilio Giudice, President of the Natural reserve "Biviere" and member of LIPU- Italian League for Bird Protection	January, 2019
7	Luciana Carfì, Co-founder of the "Coordination of Women for the territory of Gela", member of local branch of ARCI	January, 2019 October, 2020
8	Orazio Mili, Member of the "Committee of Families of the victims by chlorine soda sector in Gela"	January, 2019
9	Giovanni Iudice, Local artist and environmental activist	January, 2019
10	President of the "Committee of Fishermen from Licata"	January, 2019
11	Component of the "Committee of Fishermen from Licata"	January, 2019
12	Farmer since generations	January 2019
13	Ex-volunteer in the "Pros Oncologic Pole Movement"	September, 2020
14	President "FIAB", ex- city council member, ex-member Legambiente Gela	September, 2020
15	Enzo, co-founder Laudato Sì	September, 2020
16	Virginia Farruggio, current city council member for the Movement Five Stars, ex-president "Legambiente Gela"	September, 2020
17	Organic farmer in the plain of Gela	September, 2020
18	Co-founder and spoke person of the "Movement of the Wives of the Former Workers of the Satellite Activities"	October, 2020
19	Gaetano, president of "SMAF"	October, 2020
20	President of Aria Nuova	October, 2020
21	President of ONA Gela	October, 2020
22	President of ADOS Gela	October, 2020
23	Historical resident of Niscemi, previously a farmer	October, 2020
24	President of FARC & C	October, 2020
25	President of the local ARCI "Le Nuvole"	October, 2020
26	Co-founder of ADOCES, author of the book "Io voglio vivere"	October, 2020
27	Manuel Zaferano, co-founder of Geloi Wetlands	October, 2020

28	Graziano Amato, local journalist, ex-member NO ENI and NO MUOS Gela Committee	October, 2020
29	President and spoke person of "Pro-Porto Rifugio Committee"	October, 2020
30	President of "Unione Provinciale degli Agricoltori", farmers trade union	October, 2020
31	President of Coldiretti Caltanissetta	October, 2020
32	Owner of a company of natural sponge in Gela	October, 2020
33	Interview with 2 members of ShipLab, Gaetano and Alessandra	October, 2020
34	Municipal employer at the planning sector of the municipality of Gela	March, 2020
35	President of CGIL Industrial workers sector Sicily	March, 2021
36	Architect of the Master Plan of the PRG Gela in the '90s	April, 2021
37	Fisherman of Gela since generations	April, 2021
38	President and spokesperson of the "Fishermen's Association of Gela"	April, 2021
39	Franco Gallo, ex-mayor of Gela, ex-president Legambiente Gela in the '80s	April, 2021
40	Architect of the PRG Gela until its approval	April, 2021
41	2 Trade Unionists CIGL Gela	April, 2021

FG	FOCUS GROUP	WHEN
1	4 members of local network of associations "Gelensis Populus"	September, 2020
2	5 members of the NO TRIV Licata movement	September, 2020
3	4 members of G.A.G.	October, 2020
4	4 ex cancer patients, nowadays volunteers FARC & C	October, 2020

WI	WALKING INTERVIEW	WHEN	WHERE
1	Andrea Turco, local journalist, ex-member of "NO ENI Committee" and co-founder of the Sicilian branch of the non-profit organization "A Sud" Daniela, ex-member of "NO ENI Committee"	October, 2018	The town of Gela
2	Farmer since generations	January, 2019	The plain of Gela His farm
3	Davide, co-founder Gheloi Wetland	September, 2020	
4	Several members of G.A.G.	October, 2020	Plain of Gela, Manfria hill
5	President and ex-president of Casa del Volontariato	October, 2020	Casa del Volontariato
6	President of C.E.A. Niscemi	October, 2020	Natural History District Educational Museum
8	Mario, il Giardino delle Belle	October, 2020	Giardino delle Belle e Butera area
7	Franco Gallo, ex-mayor of Gela, ex-president Legambiente Gela in the '80s	April, 2020	The entire plain of Gela with specific attention to the illegal urban

			development areas
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	TOXIC TOUR	WHEN	WHERE
1	Andrea Turco, local journalist, ex-member of "NO ENI Committee" and co-founder of the Sicilian branch of the non-profit organization "A Sud"	October, 2020	Plain of Gela and Ex Cipolla Landfill