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Liquid Legacies

The intricate relationship between nature and human enterprises in the Agno Valley

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Summary

Acknowledgements

The reason behind the writing of this thesis is closely related to the relationship I have with my hometown, which is very delicate and emotional. I have moved several times in search of my role in the world – whether for work purposes, education, love, or to pursue my most heartfelt dreams. Yet, when I go back to where I started, I know deep inside it is the place I call home*, where everything is known and familiar. And every time, I like to make room for the appreciation of the surroundings: it is astonishing to me that the scents and the sounds of this environment and landscape always feel the same, as if this place was eternally unique, unaffected by time, and unaltered - despite the signs of its corruption becoming increasingly evident everywhere.*

First and foremost, I would like to express my gratitude to Professor Bassi and Professor Pranovi for their guidance and insightful feedbacks, and their continuous availability throughout the process. Special thanks to everyone who actively contributed to the writing process through their collaboration and engaging discussions, particularly Vincenzo Cordiano and Alberto Peruffo who greatly improved this work, as well as all those who took the time to respond to the ethnographic insight.

Finally, I wish to express my deepest gratitude to my family and friends for their unconditional love, patience, and constant support throughout this journey.

I am deeply grateful to all the encounters of this journey.

Abstract

In the last decades, industrial development has undergone significant dualism, constantly advancing yet always on the verge of potential systemic decline. This ambivalence was made possible by a convergence of global challenges correlated to the environment, including climate change, resources depletion, and pollution. Increasing environmental awareness among the people and within industrial sectors has been steadily growing over the past few decades and has played a crucial role in loudly demanding for better practices and more sustainable products, both socially and environmentally. Moreover, regulatory pressures from governments and international bodies have forced companies to reconsider and renovate their production processes. As a result, the global productive sectors have evolved into competitive arenas where environmental and climatic performances are firmly chased, sometimes even achieved, though not always. Companies now strive not only for economic enrichment but also put an effort into sustainable practices that minimize their ecological footprint and contribute positively to the fight against climate change – as well as for the green idea they give of themselves to the outside world. Fighting climate change-related events is, in fact, deemed a technical problem to be solved rather than a chance to develop a path towards temporal and intergenerational justice. Hence, there is a growing need to induce companies to re-think their productive processes, ensuring the inclusion of a holistic viewpoint, for it is now pivotal that a new efficient balance between the well-being of individuals and the well-being of our natural surroundings is put in place.

The central focus of this thesis is the Agno Valley, once a slow-paced Valley, a people Valley, now closer to a bustling industrial area, where it is crucial to define the interaction between humans – the polluters – and the surrounding environment – the polluted. The purpose is to provide an insightful examination of the Miteni case study, embodying one of the countless symbols of the failure of peaceful coexistence between the locals and the natural environment. The Agno Valley is now an ever-present subject of many international debates concerning water pollution due to the presence of persistent pollutants. Situated in the north-eastern corner of Italy, this area has experienced significant industrial development over the past

decades, without specific regulations addressing chemical contamination of the various environmental compartments. A warning sign of troubles.

The adopted approach assumes that the humans of the Agno Valley have profoundly interfered with its natural balance and authenticity and, despite the numerous warnings about the entity of the pollution caused by chemical substances distribution, little has been brought to practice, leading to relentless and persistent contamination, still taking place. The articulations of the theoretical assumptions are driven by existing and referenced knowledge as well as humanly analytical questions, like: how has the relationship between humans and nature evolved in sight of soil and water contamination scenarios, and how has the perception of this relationship changed over time? Will it be possible to settle a new equilibrium between two realms that appear so different and unbalanced, and yet are deeply interconnected?

The aim of this thesis is to provide a nuanced understanding of the once-vital bond between human and nature, between the Agno Valley dwellers and the Agno watercourse, now irremediably altered, without assuming a nostalgic perspective, but rather through an analysis of the understanding of its modifications, bolstered by the eyes and words of the inhabitants. By examining the historical context and the transformation of this relationship, the thesis seeks to explore the causes and effects of the changes that have occurred. It will delve into the reasons behind the shift from a predominantly agricultural society to an industrialized one, considering how this transition impacted the human-watercourse relationship. Ultimately, the thesis will address accountability: through the investigation of the roles played by various stakeholders, including local communities, industrial enterprises, and governmental policies. By questioning the causes and effects of the altered bond between the Agno Valley inhabitants and the Agno watercourse, this study aims to highlight the consequences of industrialization and modernization on the natural and social fabric of the region. The aspiration is to contribute to the broader discourse on sustainable development and the preservation of essential natural resources surrounded by the audacity of the economic progress. We need forward-thinking strategies and a well-developed conceptual framework to comprehend and address the complexities of global environmental issues. But in order to understand *what* is essential to understand *why*: this knowledge is vital for local actions with a global perspective (*think global, act local*) but it is only achieved through the combination of conceptual and practical experience of a community. Since a deep reassessment of

environmental ethics is necessary, nature's intrinsic rights and moral status should start to be acknowledged and universally upheld, with the means of environmental inclusiveness and a worldwide perspective.

Introduction: Overview of the Agno Valley

This intellectual endeavor is crafted with the intention to amplify an already prominent issue. In what will be further described as the Agno Valley, is now lying one of the most controversial of the infrastructures describing the intertwining relationship between the natural and the artificial world – one of the countless symbols of its failures and shortcomings: the ruins of the Miteni factory, together with its polluting legacy.

The Agno Valley derives its name from the Agno watercourse, which makes its way throughout the territory of six municipalities within the province of Vicenza, located in the northeastern corner of Italy. These municipalities include Recoaro Terme, Valdagno, Cornedo Vicentino, Brogliano, Castelgomberto, and Trissino: together, they are dwellings for approximately 60,000 people.

The Agno watercourse is an attractive natural feature of the province, and it links these communities both geographically and culturally. Each town contributes to the unique character and heritage of the Agno Valley, by both giving and receiving identity, creating an enriching framework of local traditions, economic activities, and social structures.

The presence of the Agno watercourse not only fosters sense of community and shared identity among the residents, but has also historically supported the agricultural and industrial activities in the region. The influence of industrialization is evident when admiring the natural landscape of the Agno Valley: it is common to notice warehouses, factories, and chimney pipes emerging alongside the natural scenery. These industrial structures are proof of the region's economic evolution, though at the expense of the natural beauty and authenticity of the valley. The combination of green fields and industrial buildings highlights the dynamic relationship between natural and artificial enterprises that characterizes the Agno Valley. Although not proven, this blending of contraries, of natural and industrial elements, reflects the area’s adaptability and resilience, showing how the Agno stream has been a vital lifeline through various phases of economic and social development. Along with this vision, it is pivotal to mention that from the opposite perspective emerges the central problem of our age: the environment is completely contaminated with substances of incredible potential for

harm.[1] Chemicals to which every living being is implicitly required to adapt and the environment to adjust are in the air we breathe and in the water we drink, with a pinch of negligence for the entity of the health effects.

Picture 1. Marianna Cisotto, 10/2024.

An overview of the Agno Valley from Castelgomberto and its Industrial Area, wedged into the natural framework of the Biotope Le Poscole.

The deep-rooted relationship between the people inhabiting the Agno Valley and the Agno watercourse mirrors the fundamental connections observed between water sources and human settlements throughout history. Water courses have always been vital for sustenance, agriculture, and transportation, forming the backbone of economic and social structures. To remark Rachel Carson's perspective, the history of life has been a history of interactions between living organisms and their surroundings, with the environment serving as the shaping force. However, more recently, a single species—humankind—has begun wielding this power to actively transform the natural world. Without surprise, much of the consequences generated by humans' activity are alarmingly irreversible. This intrinsic bond has been

[1] *Carson, R. 1962.*

extensively studied across the grandest civilizations of the past, demonstrating a universal theme in the development of human societies.[2]

Besides the mere human availment, the presence of the Agno stream has always been a meaningful benchmark for the locals: walking through its course, looking at the non-stop movement of water, gives an odd sensation of stillness and immobility, as if things would never change, as if the water would never stop flowing. The hilly landscape is another objective beauty, even though, by virtue of the human innate disposition, each one perceives it differently, subjectively, through the lenses of one's soul and senses, thus filtered by cultural traditions and experiences. Each corner of the Valley presents itself as a *unicum*: the wooded hillside edges, rugged and waved, the foot of the mountains, the wetlands.

As a part of the latter category mentioned – the wetlands – it is worth highlighting that there is an area subjected to special conservation policies, located between the territories of the three municipalities of Castelgomberto, Malo, and Cornedo Vicentino: the biotope le Poscole. A microcosm with international relevance because of the abundance of water and its multifaceted and peculiar biodiversity. It is identified as a SCI (Site of Community Interest) and is currently under the institutional protection of the European Commission. Despite this, the construction of a massive highway was conceded, trespassing the physical borders of a unique ecosystem meanwhile endangering the very reason of its denomination as a SCI and irreversibly polluting the waters, as it will be further discussed in detail. In fact, many unheard local organizations devoted their desperate endeavors to stopping the eco-crime and cruel injustice this piece of territory was subjected to.

This Valley, this small scrap of land, might be perceived by the dwellers as a protective womb, framed in between the Little Dolomites northward and the extended Padana plain southward. Here, human settlements are often embodied in the clustering of *contrades*, some of them abandoned at the end of the Second World War, many others still living and believing in a balanced co-existence with nature, doubtlessly deemed an integral part of the human-made landscape in this context.

[2] *Ibidem.*

Picture 2. Marianna Cisotto, 05/2024.

The Industrial Area adjacent to the Biotope Le Poscole. Castelgomberto.

The narrations passed down from the ancestors to the subsequent generations allow us to view this landscape as a model of typical human development. Through these stories, we can trace the evolution from isolated, agrarian communities to the initial stages of urbanization, where the influence of rural traditions remained strong. Progression begins with communities living self-sufficiently in the *contrades*, relying on agriculture, and farming up until the last century. It goes on with the initial formation of urban centers, introducing new realms of work while rural life still predominated. This progressive transformation culminated in the development of larger urban centers. In these growing cities, industrial activities began to thrive, often leading to significant consequences for the environment. These flourishing industrial realities have rapidly taken over the natural settings, marking a shift from rural, agrarian lifestyles to urban, industrialized ones. This evolution reflects a broader trend of urbanization where the expansion of industrial infrastructure has reshaped the landscape and introduced new environmental and human challenges.

The dynamic dimension of this charming little valley allows one to appreciate the intricate blend and co-existence of its natural and human-made features. There are instances where the oppressed elements of nature resist the presence of their human oppressors, and there are instances where they peacefully coexist. Often, even when it appears that nature is triumphing over the repressive influence of humankind, the complex entanglement of human and natural interactions takes an unexpected turn. This dynamic reveals a continuous struggle and interdependence, where the boundaries between nature's resilience and human intervention are constantly shifting.

In places where these frictions overshadow the established balance between humanity and nature, a subtle transition is underway. This ongoing shift suggests that, in time, either humankind or nature will assert dominance over the other, leading to the re-establishment of a perceivable order. This process will culminate in the emergence of a new normality, where a new equilibrium is reached, reflecting the outcome of the prolonged struggle between human influence and natural resilience.

The Silent Contamination of the Agno Valley

Within the framework of the industrial development in the Veneto Region, a valley characterized by flatlands and a watercourse becomes an ideal location for enhancing and expanding the target of profit. In fact, the flow of the Agno stream proved advantageous for the inhabitants of the Valley, particularly those who worked on, if not owned, fertile and productive lands. Following the historical progression of human civilization, during the XIX Century, the same fertile and productive fields rapidly became hubs of industrial lodging, thanks to which this region undertook the path that led to a major economic improvement.

Each one of the six municipalities of the Agno Valley hosts a significant and expanding industrial district. The presence of these districts highlights the strategic utilization of the valley's geographical features to support and accelerate industrial growth, bolstering the region's focus on economic advancement. Among these municipalities, one has gained worldwide notoriety for a specific environmental issue: the water and soil contamination of PFAS. In fact, the town of Trissino sadly recalls the story of a territory doomed to the siege of these *forever chemicals* on behalf of industrialism. PFAS, as in Per- and Poly- fluoroalkyl substances, are a large group of human-made synthetic chemicals widely used in various human applications, both industrial and mundane. The most infamous and fearful of their features are their persistence in the environment and in human and animals' bodies, if ingested: it is not yet ascertained whether their presence could be lethal per se, though a correlation with deadly diseases has been detected.

The municipality of Trissino is home to the remains of the company that has been producing chemical intermediaries for the agrochemical and pharmaceutical industry, in which PFAS appear to be included. It emerged as the Marzotto research center Ri.Mar. (*Ricerche Marzotto*) under the textile enterprise in 1965, and only afterwards took the name of Miteni, as the result of a joint venture between Mitsubishi and EniChem Systems (ENI). It can confidently be said that it is now globally known for being accountable for the PFAS pollution caused to its surrounding environment, especially the water compartment. The factory, located in the southern pivot of the Agno Valley, was eventually shut down in 2018 for declared bankruptcy and filed for exposing people to dangerous pollutants.

This area has been recognized as the largest European site for the PFAS-related environmental disaster. The extensive contamination due to PFAS has drawn considerable attention and concern, highlighting the severe impact on the local water supply and the broader environmental implications.

These xenobiotic substances have been in use since the late 1940s, with their production and application intensifying over the decades. As of today, they are purposefully added almost everywhere, like cross-sectional additives: from non-stick cookware and food wrappers to pesticides, from fire-fighting foams to hydro-repellent garments and cosmetics, not to mention the soils and the waters where they had been discharged.

Their widespread adoption persisted until a growing number of skeptical thinkers and researchers began to identify in them the cause of hazardous effects provoked to the natural environment and the humans' health. These individuals hypothesized a significant correlation between the presence of PFAS and various adverse effects, asking for a critical reassessment of the implications of these substances. There are many running studies on the harmful effects that these substances might have on human health, compromising the efficiency of some specific functions. It has already been established that these chemicals do, in some ways, interact with the human body.

The main verified effects of PFAS on human health are associated with hormonal disorders, an increased risk of diabetes and thyroid diseases, a reduced immune system response, and a higher risk of developing cancer. Researchers are also extensively studying other potential impacts, particularly concerning the health of fetuses and newborns, due to the alterations these chemicals can cause during early development. [3] Ongoing analyses aim to determine the full extent and nature of these interactions, as understanding the comprehensive impacts of PFAS exposure is crucial for public health.[4]

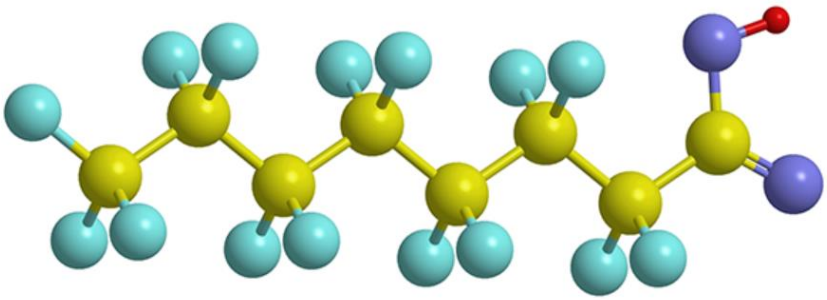
The persistence in the utilization of these substances, despite the awareness of their harmful effects, is grounded in the complexity of the physical and chemical properties of PFAS. There are around nine thousand identified PFAS molecules, which can be found in shorter or longer chains of atoms of Carbon, each one bonding with an atom of Fluorine. This carbon-fluorine

[3] *ATSDR, 2022.*
[4] *Various Authors. 2015.*

bond is one of the strongest in chemistry and it is the simplified reason behind their commercial and industrial success: because of this structure the molecule is remarkably stable and not easily subjected to degradation, much persisting in the environment instead.

The power of these products stems from their unique physical and chemical characteristics. Their tendency to be colorless, odorless, and tasteless, combined with their ability to withstand elevated temperatures, makes them highly effective yet virtually undetectable pollutants. These attributes allow them to persist in the environment unnoticed, making them the perfect silent contaminants that can infiltrate ecosystems and human bodies without immediate detection. [5]

These materials have played a crucial role in various industries, providing solutions and advancements that have contributed significantly to safety and functionality in both industrial and everyday contexts.



Picture 3: PFAS Molecule, retrieved 05/2024.

The general chain of carbon atoms (yellow) and fluorine atoms (light blue) is typical of PFAS molecules.

What remains beyond any doubt is that the Miteni factory is accountable for the release of PFAS into the environment, leading to the contamination of water across half of the region. Furthermore, numerous investigations have revealed that Miteni was aware of the potential hazards associated with discharging these contaminants as early as 1990.[6] Despite this knowledge, they continued to unload the harmful substances, partially aware of the environmental and public health risks they were creating. Residents of the Veneto Region

[5] *Various Authors. 2015.*
[6] *Liva, G. 2024.*

insist on the precautionary principle, rightfully claiming that its application might have avoided the pollution.

Among the efforts used to remove PFAS from environmental matrices there has been incineration. The issue, however, is that incinerators typically operate at temperatures between 750 and 850°C, while PFAS molecules can only be fully incinerated at around 1400°C. The risks associated with thermal destruction stem from the resilience of these substances, which is also the reason behind their creation. Incineration could mean wider dispersion of PFAS through airborne particles carried by the wind. This uncertainty makes incineration a questionable option for PFAS disposal, and given what is at stake, it is not a viable solution at this time.[7]

The very first form of PFAS created in a laboratory was the polychlorotrifluoroethylene (PFCTE) and was discovered by a German chemicals' conglomerate, precursor to its lineage of forever chemicals: Teflon.

Back in the early 1950s, the American creators of the formula working at the DuPont as chemical manufacturers, were consciously producing highly toxic and cancerogenic chemicals, but they decided not to share a rather uneasy information. At least with the public: according to some indiscretions, the American environmental attorney Robert Bilott received countless folders of papers to analyze before getting to court with DuPont, which hoped to discourage him, some of which witnessed the exchange of information between Miteni and DuPont discussing the hazardous implication of PFAS.[8]

Robert Bilott has been a key figure in the solution of the PFAS case in West Virginia, discharged in the Ohio river and producing large environmental abnormalities. He is spending his life fighting for justice and for truth to be told about these chemicals, clashing with powerful multinational corporations and living with everyday threats of retaliation. It was only thanks to him that DuPont was eventually convicted of the payment of hundreds of millions of dollars (for the sake of the application of the *Polluter Pays* principle).

[7] *Fazio, G. 2021.*
[8] *Liva, G. 2024.*

Since he already played a pivotal role in court with a multinational to address security-related issues in the water compartment, he was eventually asked to intervene in the Miteni case when the scandal of their discharge was raised. In May 2023, the lawyer travelled to Italy to meet the communities affected by the severe PFAS contamination caused by Miteni industrial activities. During his stay, Robert Bilott was heard at the Vicenza court, where the trial against some former executives is taking place.[9]

In the Veneto region, several of the affected municipalities fell under the definition of red zones[10] due to the contamination. The specific mapping of the red zones was carried out through regional resolutions and acts of the Veneto region, (e.g.: Veneto Regional Resolution 1590/2017 and subsequent updates). In these areas, residents were initially advised against drinking tap water. Eventually, it became so serious that consuming tap water was explicitly prohibited. Additionally, authorities discouraged the consumption of fish caught from contaminated waters, emphasizing the health risks involved. Using water from these streams to irrigate crops was also strongly discouraged, as it could potentially spread the contamination further into the food supply.

In response to the PFAS threat, the Region took significant steps to improve the efficiency of the aqueduct network, including the installation of activated carbon filters. These filters were believed to be able to reduce the risk of contamination in affected households. Additionally, a comprehensive blood testing campaign was initiated to assess the impact of PFAS exposure on the population. The results of these blood tests were shocking, revealing widespread contamination, and raising serious concerns for public health.

Contrary to the established threshold of 8 nanograms per milliliter (ng/mL) set by the Italian National Health Institute (ISS), the detected levels of PFAS in some cases were extraordinarily high, exceeding this limit by up to thirty times. Even more alarming were the results from blood tests conducted on former employees of the factory, who exhibited PFAS concentrations reaching astonishing levels as 91,900 ng/mL. This level is nearly beyond belief and highlights the severe extent of contamination experienced by individuals directly exposed to the factory's operations, the source of the emissions.

[9] *Ibidem.*
[10] *DGR 1590/2017.*

Picture 4. Federico Bevilacqua, 2020. Internazionale.

Behind the Miteni Plant. Trissino.

The conclusion, or *new beginning*, to the story of this dangerous eco-monster spreading dangerous chemical contamination came in 2018, as previously mentioned, when the Miteni factory declared failure and bankruptcy. However, significant concerns remain due to the lack of proper cleanup and decontamination procedures at the site where the Miteni headquarters still stand. During the ongoing court proceedings, the site is and has been neglected and left in an undesirable and abandoned state. Consequently, PFAS contaminants, in the form of percolates, has had ample time to seep into the nearest groundwater sources.

This unchecked spread of pollutants essentially provided a direct pathway to the groundwater aquifer - nestled among the provinces of Vicenza, Padua, and Verona, leading to the contamination of the second largest supply of natural water on the entire continent.[11] This vital water source supplies approximately 350,000 inhabitants with fresh water, potentially up to 800,000 people. The aquifer's expansive reach and significant capacity make it an

[11] *Coltrè, A. 2024.*

essential resource for the surrounding communities, highlighting its critical role in the region's sustainability and water availability.[12] The failure to address these critical issues has exacerbated the environmental disaster, highlighting the urgent need for remedial action.

The area surrounding the Miteni facility can be described as a sacrifice zone. This term conveys the sentiment held by many concerned citizens who believe the region has been sacrificed in the name of profit. A significant body of literature from the informed civil society addresses the PFAS issue, but the presence of sealed information, and the lack of transparent data prevent the consultation of precise data such as the carbon footprint and the full extent of the impacts on human health and local ecosystems.

The local community still lacks fundamental knowledge about the situation. Given the recent nature of these events, it is crucial to educate younger generations to anticipate the region's future, focusing on soil and water regeneration, to try and forecast possible stances. Prolonged inaction will result in greater spread of PFAS in the groundwater and soil. Immediate and effective rehabilitation efforts are necessary and numerous local entities are emphasizing the urgency of such actions: land remediation has been requested since 2016.

The shortsightedness driven by profit purposes must be condemned, and this lesson should be taught to children from an early age. This should be accompanied by a societal and cultural shift towards maintaining at least the existing natural balance. We must move away from the destructive, anthropocentric mindset, shifting towards a sustainable lifestyle, acknowledging that we share one world with other species and the relationships developed between each other are interdependent forces of a fast-track evolution.

[12] *Schirato, S., Spadacini, B. M. 2024.*

Picture 5. Marianna Cisotto, 10/2024.

An overview from above of the incriminated factory: in the distance, the town of Trissino.

The so-called *forever chemicals* have rioted many regional organizations. The Company's production of worth at the expenses of the inhabitants – humans, non-humans and more-than-humans – began to be counteracted by the very first activists in the Italian context concerned with PFAS in 2017: the Mamme No PFAS committee emerged following the running of the first blood tests and the biomonitoring gave its results.

Their crude and genuine response was immediate. They recognized the urgent need to expand local understanding of the circumstances and mitigate potential impacts, adhering to the widely accepted principle: the polluter pays. They promptly began with the very first informational events, demonstrations, and protests. Information begun to circulate rapidly and these efforts successfully and inevitably captured the attention of the residents not only of the interested provinces but even of the neighboring ones. Their actions underscored the necessity for widespread awareness and collective action to address the local environmental crisis at hand. The Mamme No PFAS committee was born from the genuine concerns of ordinary parents in 2017. They embarked on a long series of legal battles and appeals in ruling, bringing the PFAS environmental crime to the attention of the European Parliament in

Strasbourg and rapidly built a group of competent people around them, committed to the cause.

Another reality addressing this case study from its very onset is *PFAS.land*, an organization dedicated to mobilizing the no-PFAS activists throughout the Veneto region and informing the inhabitants. It is led by Alberto Peruffo, an activist concerned with matters of environmental and social justice. Another Committee that has made the PFAS contamination the core of its mission is the CILLSA (Cittadini per il Lavoro, la Legalità, la Salute e l'Ambiente – Citizens for Work, Legality, Health, and the Environment). All of them have played crucial roles in raising awareness and advocating for the action against the pervasive threat of PFAS contamination, bolstered by the involvement of ISDE Doctors[13], including Dr. Vincenzo Cordiano, president of the section of Vicenza.

The incredible history of strength, sacrifices, motivation, and robust belief in the cause is embodied in the joint cooperation between the abovementioned organizations. In fact, their collaboration has led towards the successful achievement of many goals and objectives. Among these, it is worth recalling the encounter with David Bilott, the American attorney who won the trial with the DuPont, as mentioned before, and another pivotal encounter with Marcos A. Orellana, commissioned as the United Nations Special Rapporteur, expert in international law with an extensive experience working with civil society around the world on issues concerning global environmental justice, with an education of environmental law and human rights.

He has been tasked with examining the connection between human rights and the toxic fluorine waste accumulating in northern Vicenza. Following his on-the-spot investigation in 2021, Orellana released a detailed Report urgently calling for the decontamination of hazardous sites across Italy. "*I am seriously concerned by the magnitude of the pollution with PFAS […]. In many cases Italy has not been able to protect people from the exposure to toxic substances […]. I call Italy today to ratify the Stockholm Convention on POP's and to take decisive action to address contamination by PFAS*."[14]

[13] Doctors of ISDE (International Society of Doctors for the Environment) are medical professionals who advocate for environmental health and its impact on human well-being. Founded in 1990, ISDE is a global organization of doctors and health experts focused on addressing environmental hazards—such as pollution, climate change, and chemical contaminants—that pose risks to public health.

[14] *OHCHR. (2021).*

These two pivotal meetings have significantly bolstered local interest in this critical issue, transforming a previously apathetic community into one much more engaged with the matter. In the Valley stroke by contamination, many aware and organized groups of people have risen. Support came from associations established long before, such as the one involving the ISDE Doctors, as well as from smaller, more recent groups of activists.

In 2021, the town of Castelgomberto, the second smallest municipality in the Agno Valley, saw the establishment of the newest operational committee dedicated to addressing the PFAS issue, the Associazione Salute e Territorio. This committee joined the growing network of local entities committed to combating the environmental and health challenges posed by PFAS contamination. The efforts made on these occasions have been fundamental in driving forward the agenda for environmental justice and public health and are a testament to the power of grassroots activism in driving meaningful change.

During the Miteni trial, new data collected from ARPAV in Castelgomberto discovered areas to the north of the factory contaminated with PFAS. This discovery raised two possible explanations: there could have been aerial contamination displacing fumes coming from the Miteni, or a new source of contamination might have emerged. The newborn committee in Castelgomberto began to advocate the issue on behalf of the population, primarily asking for transparency, thus the data to be unsealed.

The committee emphasized that the community needed access to this information to understand the impacts on their health and to take necessary precautions to safeguard themselves. Eventually the second source of PFAS pollution was found in the discharge pipe of the Pedemontana's construction site, thus accountable for poisoning the local SCI[15].

Those described previously can be clustered as local organizations representing the backbone of the heated debate, but of course there are many others involved in addressing the issue, for instance the National organizations of Legambiente and Europa Verde, and the international ones, such as Greenpeace. Despite these efforts, there remains a concerning level of indifference, particularly among younger generations, who show a mixed level of interest and willingness to confront reality. This apathy or lack of engagement presents a

[15] *ARPAV. (2021, July 5). Prot. n. 8195.*

challenge, as it often takes a concerted and informed effort from all the segments of society to address such critical environmental issues effectively.

It is useful to recall the words Orellana used in his Report, that appropriately define how the civil society has been informed: "*The authorities failed to warn the residents of the affected areas and to disseminate information about the pollution and the risks to residents' health posed by perfluoroalkyl and polyfluoroalkyl substances. Furthermore, they have failed to request or conduct extensive investigations of the contaminated areas. Some residents learned about the toxic contamination problem in 2016–2017, when the region initiated a health surveillance plan for the population exposed to perfluoroalkyl and polyfluoroalkyl substances in the critical red area.*"[16]

Exigency of intergenerational justice and furious demands from the youngers are expected to come in the near future, as soon as the old philosophy of consumption and production and the new, necessary lifestyle taking hold, grounded on reuse, reduce, recycle, and repurpose will be clearly disjoint and spaced apart. Furthermore, this separation and the vivid experience of it will enlighten the indispensable contemplation on our role in the Anthropocene and its effects on the other species, wondering how we could change or orient our anthropogenic and anthropocentric behaviors.[17] By all means, take on a challenge, re-think and question ourselves, face and debate the diversity are the steps we must take towards the establishment of a new normal, in accordance with our existence on the earth as earthlings, rather than geological forcers.

[16] *OHCHR. (2021).*
[17] *Ball, K. 2022.*

Understanding the Local Awareness

Being the aware witnesses of dramatic environmental scenarios can likely lead to the development of a status known as solastalgia. This distress is caused by the environmental change occurring in one's homeland, mixed with the awareness that, as powerless individuals, we can do next to nothing to stop it.

The Italian region known as a symbol of PFAS pollution is, in fact, a *solastalgic* territory. The distress is the result of years of PFAS's leakages from Miteni, combined with those from the Strada Pedemontana Veneta, the ultimate highway crossing the Agno Valley. Both these controversial projects of concrete follow a similar timeline of environmental incidents in a territory that, again, did not require, nor needed, such interventions. These kinds of *eco-monsters* often emerge without regard for the intrinsic values and ecological functions that the natural landscapes carry out, nor for the rich human history, wisdom and experience that will be lost upon altering the landscape.

For most of the locals and for the environmental disasters' connoisseurs, this narration is nothing new. The SPV project was strongly desired since the seventies, when the rapidity of the social, economic, and industrial development of the Veneto Region claimed for a junction connecting those areas with an increasing demand for mobility.

Back in February of 1990, the Strada Pedemontana Veneta started to be part of public documents and was included in the Regional Transportation Plan[18]. In 2009 it started to be put into work, through the applause of the enthusiasts and the taunting of the sceptics. The opening was planned for 2018 but that year the project saw the inauguration of only some of the scheduled road sections. Eventually, it reached completion at the very beginning of 2024: with ninety-four kilometers of concrete through thirty-six towns, and a cost projected to reach thirteen billion euros.

After its realization, despite its controversies, strongly argued during the past years, it seems reasonable to ask ourselves if this mega-construction has in some ways helped our daily life,

[18] *SPV. 2019, June 19.*

put at stake or irreparably damaged our surroundings, thus our connection with nature, or if it is perceived just as a conventional deed, and thus, neglected. Ultimately, how did the intrusion of tons of concrete influence the appreciation of this once-greener valley in the eyes of its own inhabitants? How did it affect the perception of its worth?

In 2021, the PFAS contamination scandal involving the highway construction erupted: it appears that, to compensate for the softness of the ground, the contracting company decided to inject accelerants into the concrete used in the construction to speed up solidification. This intervention backfired: the high release of PFAS boosting the accelerants into the surrounding soil led to extremely elevated levels of these substances in the Rio Poscoletta, where the constructor discharged its wastewater, and where they were initially found. By being automatically released into the soil and slowly pushed by the waters, they ended up being anywhere and everywhere, shifting the contamination's limit previously set by Miteni.

The local community is not yet fully acquainted with the basic knowledge of the case. Since it is quite recent it would be fundamental to make – especially – younger generations coming up, aware of the specificities, to try and forecast a probable future of the area, adjusting, and regenerating the contaminated soil and water. The more the time of inaction is, the larger the spreading of PFAS in the underground waters and soil is going to be. An effective and immediate rehabilitation is needed and there are many local realities calling for the urgency of stances.

While it is remarkable that, thanks to this project, small centers are now trucks-free and people are reaching large hospitals - as those along the SPV route - in a shorter time than before, it is also delusional that the same people were convinced that they would have been economically facilitated in the payments of the tolls. The promises of the first hour claimed that the citizens of the Region would not have been charged by any toll or tax. Eventually, not only the citizens using the recently built highway are paying one of the highest prices per kilometer (0,16€/km) in the whole country, but they will also bear the heavy burden of the concession agreement signed by the Region with the private institution in charge of the works.

Picture 6: Marianna Cisotto, 10/2024.

An overview from Sant'Urbano (Montecchio Maggiore) of the Pedemontana passage in the Agno Valley.

According to this project-financing contract, the concession with the private agency will last for the next 39 years, during which the expectations of profit for the private constructor are high, up to fifteen billion Euros. If, disgracefully, the revenue collection will not reach the forecasted objective, the money of the Region will have to cover the difference. More precisely, the money of the citizens: the same citizens that were promised not to pay at all.

Another flaw of this big intervention affects the presence of a natural area within its track. This area crossed by the large highway is recognized as part of the Natura Network 2000. This Network is framed by the European Union in the policies for the conservation of protected areas and their biodiversity. It is an extremely important instrument to identify those delicate sites demanding more attentive management because of the preciousness of their maintenance and their threatened conditions.

Picture 7: Co.Ve.P.A. – Coordinamento Veneto Pedemontana Alternativa

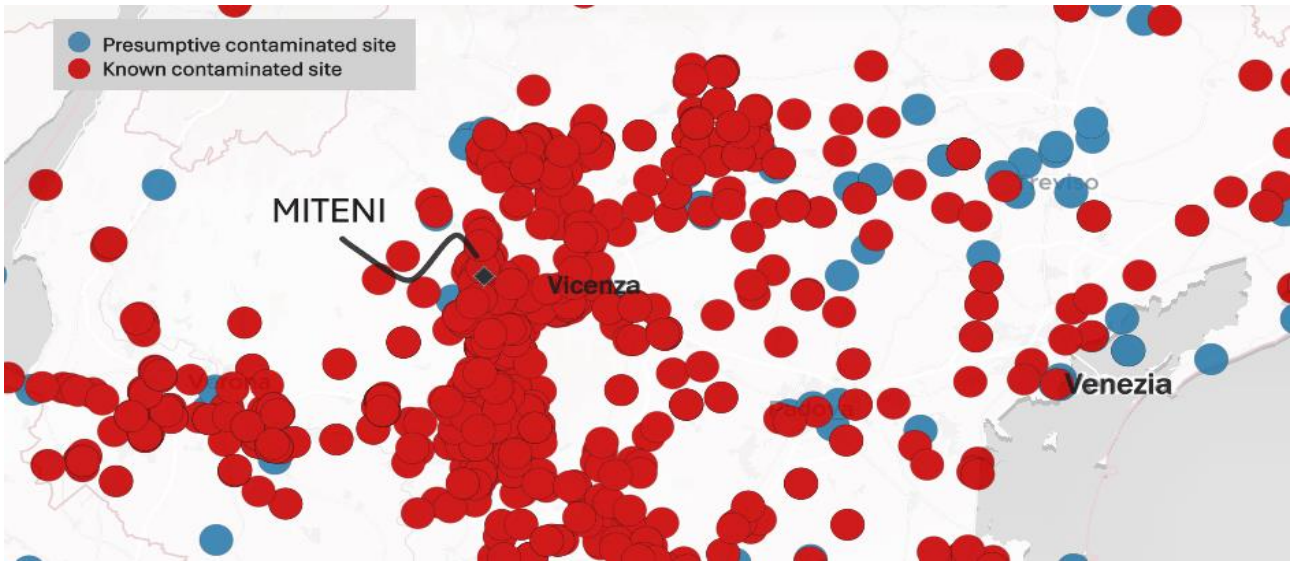
The sinkholes occurred many times during the construction of the SPV; the one in the picture dates to September 2017. The soil structure and the risk of karst instability required interventions of consolidation.

The fact that the SPV is crossing one of these sites is the result of mistakes that occurred during the phase of project designing, because of a neglectful and inattentive analysis of Environmental Impact Assessment (EIA).

The violated site, as mentioned before, is known as Biotope Le Poscole, renowned for the presence of natural springs and the natural wetland fauna. This area was already made vulnerable by agricultural and farming activities. Points of naturalistic and environmental interest shared between the neighboring towns of Castelgomberto, Cornedo Vicentino and Malo. The richness of this ecosystem is characterized by the abundance of water, which fosters favorable living conditions for numerous amphibious species, local reptiles, and a diverse array of vascular flora, counting over five hundred registered species.

There is now high confidence in saying that the crossing of a highway will permanently jeopardize the structure and the functioning of a precious, protected ecosystem. Moreover, the tunnel built in this area - with its generous 6 km, has a serious risk of collapse under the weight of the ground above. As was previously mentioned, the hydrogeological instability of this piece of land was considered ex-post, only around the completion of the works.

The PFBA found in the concrete triggered a serious switch in the relationship between humans and the natural world. This pollution was initially felt by the inhabitants as silent pollution: most of the people were not even aware of the consequences of this dispersion and without visible effects it started to be ignored. It was when the Miteni case started its court trial thanks to the three hundred civil parties involved that the eco of its relevance started to be heard.



Picture 8: Forever Pollution Project – The map of Europe's PFAS contamination.

A section of the area of interest that highlights the presence of many contaminated sites.

In the context of understanding accountabilities, I wish to present the investigation that was conducted in April 2024: the aim was to delve into the intricate dynamics and relations between the natural environment and humanity by utilizing a comprehensive interview to be subjected to the Valley's inhabitants, with a particular focus on examining the impact of the PFAS contamination and the Pedemontana construction as a pivotal turning point.

A well-balanced questionnaire was developed, focusing on both the quantity and quality of questioning, and submitted to the interested parties, the Valley's inhabitants, with a resulting sample size of forty-four respondents. The questioning was conducted in Italian, being the participants Italian-speakers, and mostly in a written form. It became evident that the sample was not as homogeneous as originally thought, particularly concerning origin and age; however, constructing a perfect statistical sample was not the objective.

The questionnaire was presented under the title of:

Land relations in the Agno Valley.

How does the perception of the human-nature relationship change with reference to the construction of the SPV.

Relazioni di terra nella Valle dell'Agno.

Come cambia la percezione del rapporto uomo-natura in riferimento alla costruzione della SPV.

Picture 9: Marianna Cisotto, 10/2024.

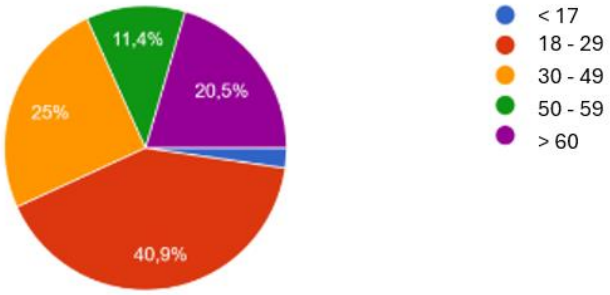
The proximity of the SPV to the Agno River in a location around Trissino.

The stated objective of this survey was to investigate *the varied perception of the human-environment relationship in the valley using the construction of the Strada Pedemontana Veneta as a watershed*. A watershed between what the Valley was before and after its introduction.

The initial inquiries were centered on the demographic investigation of the participants.

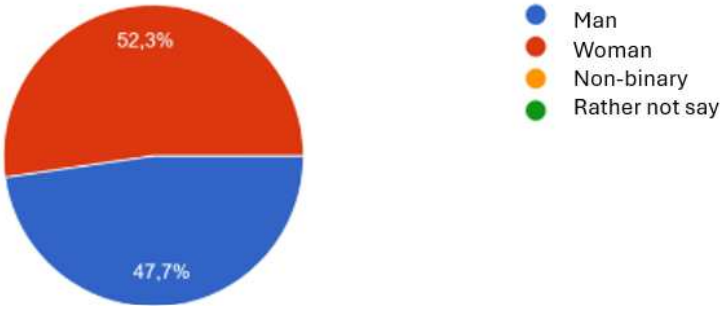
Choose the age range that best represents your age

44 answers



Choose the gender identity with which you best identify (man; woman; non-binary; rather not say;)

44 answers



Origin: do you live or have lived in the Agno Valley? If yes, in which town?

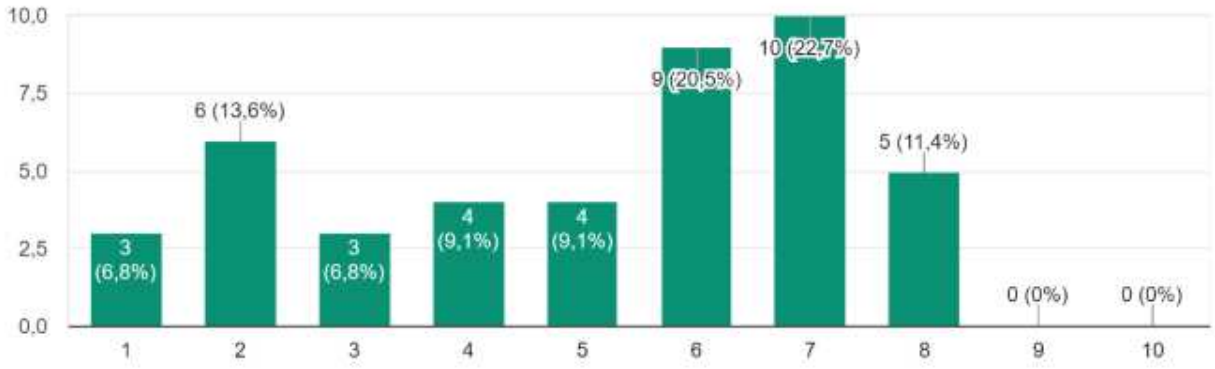
44 answers

From this initial analysis, it emerges that the majority of the respondent sample is young (40,9%); the gender distribution is balanced, with 52,3% of women and 47,7% of men, whereas in terms of origin, the majority are residents of Castelgomberto.

The following question wanted to deepen the knowledge and understanding of the SPV among the responding sample, where twenty-four out of forty-four respondents felt they possessed sufficient to discreet knowledge of the project.

How well informed do you feel about the Strada Pedemontana Veneta project?

44 answers



The analysis becomes more intriguing as we delve deeper into it. Following the initial warm-up, the questions delve more precisely into individuals' perceptions of the benefits or damages they would perceive from the construction of the SPV.

Do you think you will benefit from or be harmed by the construction of a highway like the Pedemontana Veneta?

44 answers

The pre-determined responses, with a majority of responses in red and blue, reveal that most people believe the SPV is more inclined to pose a threat to their existence or cause harm to it. Despite the overwhelming result of the red section over the blue one, it is important to note that almost 40% of the sample considered the construction of the SPV a benefit to their lives.

The pre-determined answers stated that the SPV could be perceived as:

- a benefit *(blue section):* offering more rapid links, innovative infrastructures, bringing high regional revenues.
- a damage *(red section):* considering the accumulation of atmospheric particulate matter, excessive changes in land use, geomorphological interventions, traversing protected areas, and the unclear movement of regional money.

This section allowed for the inclusion of open-ended responses, which revealed additional noteworthy points, such as the dual consideration of the project, including both the negative and positive aspects: while it promises enhanced connectivity through faster links, it will also inevitably lead to environmental impacts ("*Ne trarrò benefici per i collegamenti più veloci, ma ci saranno danni creati dall'impatto ambientale che un'opera di queste dimensioni e materiali causa."* - I will benefit from the faster connections, but there will be damage caused by the environmental impact that a work of this size and material inevitably causes).

A much more nuanced reflection is given by an informed citizen: "*Danni inquantificabili arrecati al suolo e al paesaggio naturale, rifiuti sepolti sotto il cemento, probabile incremento del traffico. Oltre a questo resta il grande punto interrogativo del tratto che porta al paese di Malo, costruito sopra un terreno argilloso e soggetto a modifiche strutturali. Beneficio invece per quanto riguarda l'agibilità e la velocità con cui ora si può giungere nelle località di interesse attraversate dalla superstrada. "* Unquantifiable damage to soil and natural landscape, waste buried under cement, traffic increase. Besides this, there remains the great question mark of the tunnel leading to the town of Malo, built on clay ground and subject to structural changes. Benefit in terms of accessibility and rapidity with which the cities connected by the motorway can be reached.

In both cases the Valley's inhabitants are diplomatically showing both the faces of the coin: it is beyond question that it will serve faster connectivity, but what will be the environmental cost?

Additional responses were provided:

"Penso che saremo edotti del danno fra qualche anno." - I think we will be made aware of the damage in a few years.

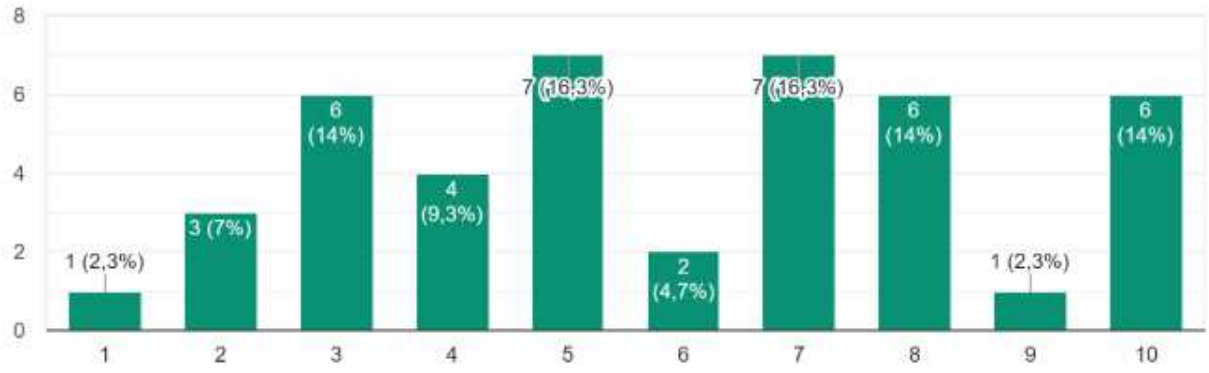
"Ininfluente rispetto alle mie esigenze." - It is irrelevant to my needs.

"La pedemontana si trova inserita in un contesto viario della valle dell'agno che allo stato (attuale, n.d.a.) si trova inflazionato da troppe strade di scorrimento." – SPV is part of a context already inflated by too many roads.

The following question was aimed at reconfirming what was expressed in a previous one. Here the focus was the reassessment of the understanding of the SPV in terms of benefits and damages: the reassessment was positively considered since more than 50% considered the perception of the provoked damages to be higher than five out of ten.

In relation to the previous question, please quantify on a scale from 1 to 10 your perception of the discomfort that the Pedemontana Veneta (SPV) may cause in the area of the Valley (considering social, economic, and environmental factors).

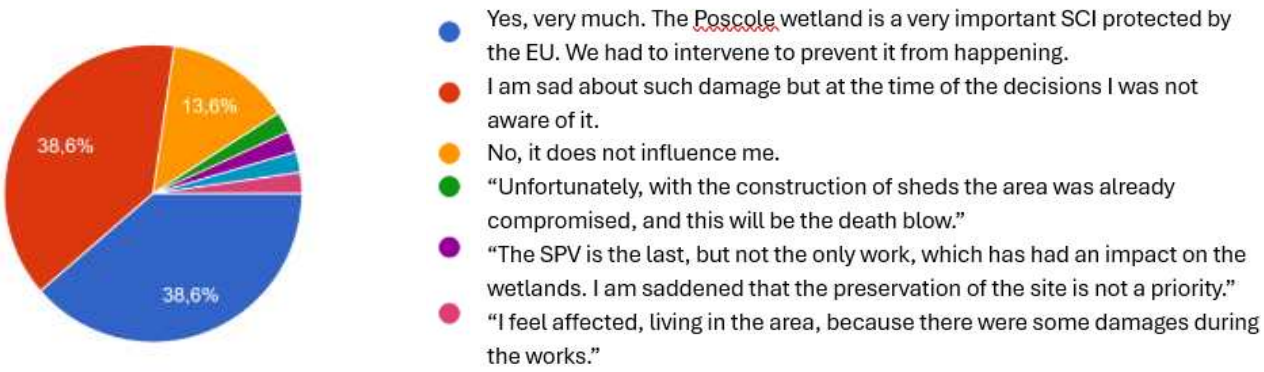
44 answers



The final three questions were formulated to address concerns regarding expropriation and land utilization, pollution, and the contamination of groundwater due to sewage overflow.

The SPV crosses one of the wetland areas protected by EU regulations: the Poscole. Over time, this ecosystem could suffer irreparable damage. Do you feel affected by this?

44 answers



The formal question above is asking if the respondent feels affected by the fact that the SPV crosses an area of Natura Network 2000 which, as already mentioned in the treatise, holds significant ecological importance and thus, it is protected. The first three answers were pre-determined. What stands out from this response summary is the evenness between the red and the blue sections, thus described:

- Yes, I feel affected. This wet zone is a particularly important SCI (Site of Community interest) and needs to be protected. It was necessary to intervene.
- I am saddened by such damage, but at the time of action I was not aware of its importance.

The aim was to emphasize this response to underscore a specific point: frequently, individuals tend to overlook, or worse, disregard *the treasure in their own backyard*. Would it have had any impact if the Valley residents had been (more) aware of the significance of the wet zone of the Poscole? Would the Pedemontana have been built in the same location?

Additional respondents highlighted that the area had already been impacted by the nearby Industrial Zone, suggesting that the SPV could potentially exacerbate the situation and lead to dire consequences.

"Purtroppo con la costruzione di capannoni l'area era già compromessa, e questo sarà il colpo mortale." – Unfortunately, with the construction of sheds the area was already compromised, and this will be its death blow.

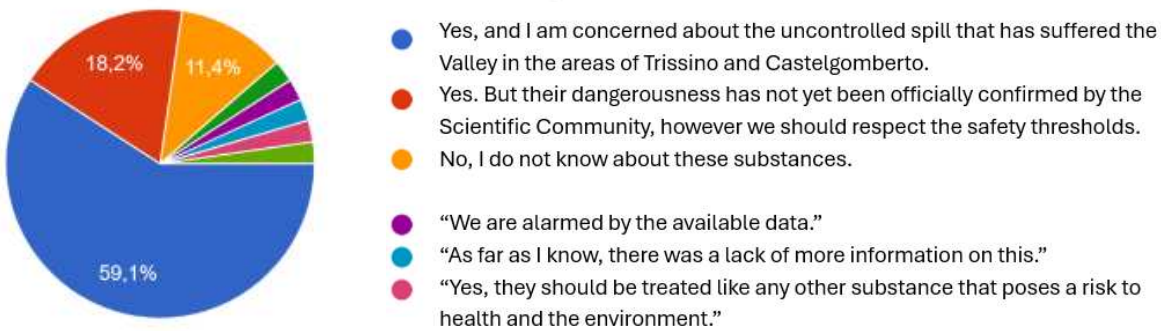
"La SPV è l'ultima opera, ma non l'unica, che ha avuto un impatto sul sito delle Poscole. Mi rattrista che la salvaguardia del sito non sia una priorità per lo sviluppo urbano." – The SPV is the last, but not the only project, which has had an impact on the wetlands. I am saddened that the preservation of the site is not a priority for urban development.

"Mi sento influenzata, abitando nella zona, anche perché ci sono stati dei danni durante i lavori." – I feel affected, living in the area, because there was some damage during the works.

The following question proves that this topic holds particular importance in this region, with the coordination of almost 60% of the respondents. The people residing in this area are familiar with the presence and harmful effects of these substances, in fact only five people declared complete unawareness.

In 2021, the issue of second-generation PFAS (PFBA) in the concrete used for the Pedemontana project emerged. Do you feel sufficiently aware of the persistence and dangers associated with these substances?

44 answers



The question's purpose was to investigate people's awareness of the presence of chemical pollutants, considering that they doomed an entire region to unprecedented contamination, starting exactly from one of the municipalities of the Valley. It is encouraging to see that almost six out of ten people are informed and responsive to this matter. It is important to recognize that the lands and the waters of the Valley were poisoned by the PFAS and that the region will be doomed to this condition of contamination for a long time, considering the persistence of these chemicals.

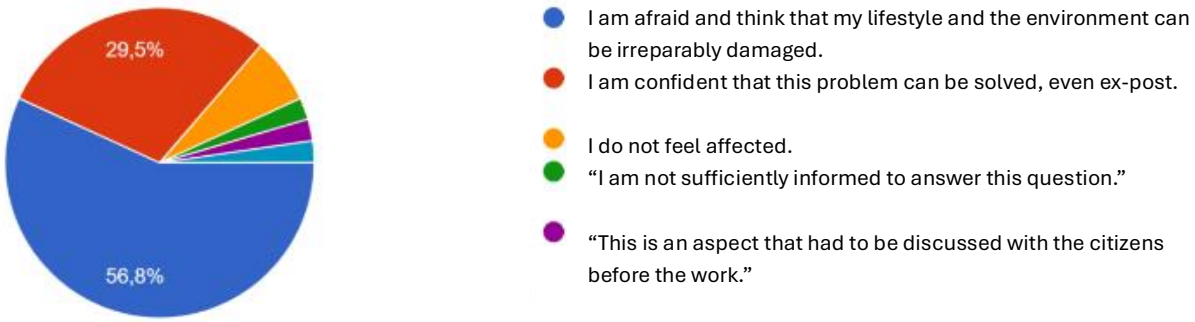
Even if we were to regard pollution as the *assimilative capacity* of the environment, defining a specific one for perfluoroalkyl substances would be challenging due to data limitations. There is still a lack of information regarding their abundance, persistence in the environment, and the specific temperature at which they are destroyed. Nonetheless, acknowledging the concept of a pollution threshold, which aligns with the environment's capacity to absorb pollutants without causing harm, condones the act of pollution, ruthlessly.

On this front, many were the associations created with the purpose of denouncing and condemning the industry that widely released the PFAS in the environment. As mentioned before, above the others is the Mamme NO PFAS association, a local union of mothers protesting for their children's contaminated blood.

The following question recalls the matter of contaminated water, previously explored.

The Pedemontana Veneta crosses a significant aquifer. The risk to the drinking water, which should have been evaluated beforehand, pertains to the potential leaching of pollutants into the water supply for surrounding municipalities. How aware are you of this issue?

44 answers



As was said for the previous question, the water matter is a heavy one in this social and regional context, and this is exactly the reason why the 56,8% of the answers point out the fear the population have in terms of damages that could occur to the groundwater.

The choice to include an open-ended question in the conclusion was made to ensure the most comprehensive understanding of the questionnaire provided. In fact, it specifies: **"With reference to the three previous questions (SCI zone, PFAS spill and passage on the aquifer), did your opinion change especially following the last three questions about the SCI, PFAS contamination, and possible groundwater pollution?"**

In the end, this last poll summarized the respondents' impressions of the Valley, on the SPV and their perception of the life-changing introduction they will be personally living; I will outline a few of them here, starting with an exceptional point of view in favor:

"Sì, ero a conoscenza dei fatti. La Pedemontana è un'opera che aiuterà i lavoratori pendolari a spostarsi più velocemente, ma in termini di inquinamento non so esprimermi. Se succede un incidente in provinciale il traffico è intasato. La Pedemontana offre una valida alternativa." - Yes, I was aware of the facts. The Pedemontana is a project that will help commuters to move faster, but in terms of pollution I cannot express an opinion. If an accident occurs, the local traffic is blocked. The Pedemontana highway offers a viable alternative.

Less informed citizens were surprised when confronted with certain controversies hidden within the project.

"Non ero a conoscenza dei fatti sopra citati. Col senno di poi scorporerei la risposta data alla domanda riferita alla quantificazione del disagio sociale, economico e ambientale, attribuendo punteggi separati: 1 disagio economico, 2 disagio sociale, 9 disagio ambientale." - I was not aware of the abovementioned facts. In hindsight I would break down the answer given to the question related to the quantification of social, economic, and environmental distress, assigning separate scores: 1 to economic distress, 2 to social distress, 9 to environmental distress.

"No, ero parzialmente a conoscenza di tutto. Rimango dell'idea che non doveva essere costruita." - No, I was partially aware of everything. I remain with the idea that it should not have been built.

"Il passaggio della Pedemontana sulla falda era un dettaglio a cui non avevo dato molta importanza in principio ma che ora mi preoccupa molto, vista la grande quantità di acqua dal rubinetto che consumo." - The passage of the Pedemontana on the aquifer was a detail to which I had not given much importance in the beginning but that now worries me very much, given the great amount of tap water that I consume.

"Anche se non ero a conoscenza di alcuni dati sono consapevole che opere così importanti abbiano un'influenza e un impatto negativo su molti aspetti ambientali, dai corridoi ecologici fino all'inquinamento di acqua, aria e al cambiamento climatico." - Although I was not aware of some data, I am aware that such important works have an influence and a negative impact on many environmental aspects, from ecological corridors to water pollution, air pollution and climate change.

"Non è cambiato il mio modo di percepire questa costruzione, anzi non essendo molto informata facendo il sondaggio ho scoperto altri rischi che hanno aumentato in me la percezione di danno." – My way of perceiving this construction has not changed, in fact, by not being very informed while I was doing the survey, I discovered other risks that have increased my perception of the harm it will cause.

The valley area also teems with individuals who have dedicated themselves to the topic, people who have been included in the completion of this questionnaire.

"Ero a conoscenza di tutto ciò, quindi la mia percezione sulla creazione della SPV non cambia, però ci tengo a dire che è una vergogna la maniera in cui sono stati svolti i lavori, ma soprattutto i controlli sulla salvaguardia del territorio." – I was aware of all this, therefore my perception about the creation of the SPV does not change, but I want to say that it is a shame how the work has been carried out, but especially the controls on the protection of the territory.

"No, non è cambiato. Penso ancora che la SPV sia un danno costruito su violazioni sistematiche delle direttive e normativa ambientale, del diritto costituzionale e dei principi di giustizia sociale." – No, it hasn't changed. I still think that the SPV is a damage built on systematic violations of environmental directives and regulations, constitutional law, and principles of social justice.

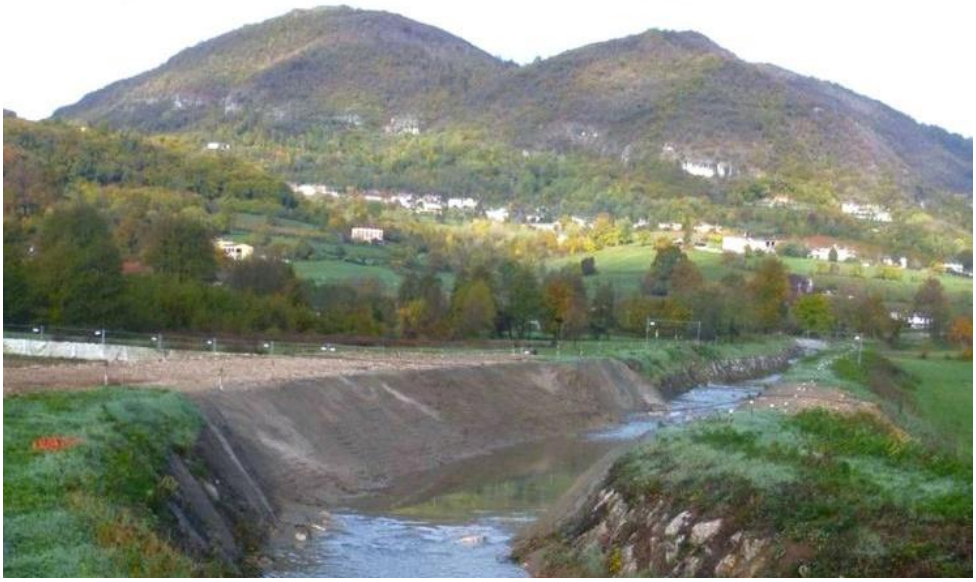
“La viabilità in generale è uno degli assi portanti di una economia che fino ai giorni nostri ha concepito lo spostamento di beni da un punto ad un altro come presidio fondamentale per lo sviluppo. Oggi alla luce di un necessario quanto doveroso approccio di sostenibilità, questa concezione impone una riconversione delle produzioni a misura ecosistemica e di conseguenza una rivisitazione della viabilità intesa nel modo tradizionale. Anche la Pedemontana Veneta soffre di poca lungimiranza e di errori progettuali che hanno sacrificato territori pregiati senza necessità.

Esempio ne è il tunnel Valdagno-Schio che, se diversamente realizzato a Cornedo Vicentino avrebbe soddisfatto tutta la viabilità di vallata senza passare per un sito di interesse europeo SIC IT3220039 Biotopo Le Poscole. Da rilevare inoltre che la realizzazione della superstrada PV è fondata su project financing, con un impegnativo esborso economico e relativi servizi negati da parte dei cittadini in caso di mancato traffico stimato. A questo si aggiunge il problema PFAS, sostanze utilizzate come accelerante nei cementi per la costruzione delle gallerie e defluite nelle acque di superficie e poi in falda. Ad oggi è acclarata la pericolosità per gli umani derivante da queste sostanze presenti nelle acque di scolo di una ditta MITENI di Trissino e causa di uno degli inquinamenti più estesi d'Europa. Una riflessione ultima è la mancata percezione di un dovere di cambiamento, di un salto antropologico che ci unisca nella forma di utilizzo dell'intero ecosistema come unica e in armonia.

La riflessione in merito a questa opera viaria necessita di una lettura e una analisi dei documenti già dalla fase istruttoria. Si può comunque affermare che il danno è evidente dal punto di vista ambientale, sociale, di realizzazione con tempi dilatati, di costi e un esborso economico per la regione (finanza di progetto) che inevitabilmente ricadrà sui cittadini del Veneto.”

The road in general is one of the main pillars of an economy that until today has conceived the movement of goods from one point to another as a fundamental step for development. Today, in the light of a necessary approach to sustainability, this concept requires a conversion of the production to ecosystem measures and consequently a reorientation of the road network understood in the traditional way. Even the Strada Pedemontana Veneta suffers from short-sightedness and design errors that have sacrificed valuable territories without a real need to host it. An example is the Valdagno-Schio tunnel, which, if it had been built in Cornedo

Vicentino, would have satisfied all the Valley's roadways without passing through a site of European interest SIC IT3220039 Biotope Le Poscole. It should also be noted that the construction of the SPV is based on project financing, with high economic demands and related services denied to citizens in case the traffic estimations fail. There is also the problem of PFAS, substances used as accelerants in cement for tunnel construction being discharged into surface water and then into the groundwater. The danger to humans from these substances in the sewage of the Miteni Company in Trissino, which is responsible for one of the most extensive types of pollution in Europe, has recently been ascertained. A final reflection is the lack of perception of a duty to change, an anthropological leap that unites us in the way we consider the entire ecosystem as unique and in harmony. The reflection on this highway construction requires an analysis of documents already from the investigation phase. It can be said, however, that the damage is already clear from various point of view: the environmental and social one, of the time needed to build it up, of the costs and the economic outlay for the region (project finance) which will inevitably fall on the citizens of Veneto.



Picture 10. Marianna Cisotto, 2022.

An area of the Agno Valley with the flowing river, clearly altered by structural modifications.

In general, the narration of the facts is primarily crude and realistic. The interviews revealed that part of the population remains unaware of the issues, often disregarding or ignoring news and expert opinions on the matter. However, to gather insights and ideas from individuals who have deeply explored and actively participated in the PFAS case – particularly concerning the Miteni's activity – key figures of the debate, such as Alberto Peruffo and Vincenzo Cordiano, provided insightful responses in an unpublished interview. They addressed the near future for the Agno Valley, through specific questions:

1. *Future perspectives: what are your concerns regarding the PFAS contamination for you, your family, and the future generations?*
2. *A note to the future residents of the Agno Valley. How do you see and perceive the Valley and the life in the Valley in 30 years? How will the Agno Valley be like in 2050?*

Alberto Peruffo, who has already been mentioned, is a local activist and leader of the NO PFAS Movement, as well as author and cultural director for some questions of social and environmental local justice.

Addressing the first question and offering the perspective of someone with deep knowledge about the concerns raised by PFAS contamination, he stated that "the main concerns are focused on the physical health of these territories, to their biotic and abiotic resilience, their livability together with the risk of diseases for our children and grandchildren."

He then continued by raising the usual dilemma experts and activists facing serious threats, together with their families, have to face: "*To stay or to leave*?".

It is difficult to provide answers to such challenging questions, but here Peruffo envisioned three scenarios. "*The first says to young people and families:* Leave Veneto*. And if you don't leave physically, abandon the idea of the industrial Veneto that has made these valleys unlivable. You have every right to do so because your fathers and mothers—in a political sense—have handed you a ravaged and poisoned land. The second, tied to the first, says:* If you stay, fight without reservation*. In other words, be aware that if you want a future here, you must fight with your head held high, without holding back. You are in sacrifice zones that domesticate you: to stay and live with dignity, you must shift into a higher gear. The third option, for those who remain here without lifting a finger, says:* Don't complain; you are the

dormant accomplices of the harm you lament. *It is clear, with the data in hand, that the risk of diseases will increase, and for the silent ones, life will be lethargic, servile, entirely devoted to a series of jobs at all costs—spread thin and diluted—where some, the elites, overshadow the others, the excess, the toxic waste. Together, they lull themselves into a life that seems beautiful, with an illusion of well-being."*

In responding to the second question, Peruffo clearly articulated his critical stance. He did not overlook the systemic issues and the role of both public and private entities in perpetuating environmental harm. Peruffo's position is not just one of criticism, but also a call for accountability, urging a thorough reassessment of the policies and actions that have contributed to the degradation of the region. His response is a firm commitment to advocating for change, demonstrating both his knowledge and his sense of urgency regarding the future of the Agno Valley and its inhabitants.

"Here, for decades, garbage, memory, and courage *have been buried. The public authorities abdicated their role for years, sacrificing the* common good *to sell it to a few private entities, depriving the community of dignity, health, and freedom. They have invented pseudo-identities, fictitious, senseless autonomies, as if we Venetians were a chosen civilization. First, they shouted 'Venetians,' with a capital V, celebrating excellence while burying the toxic excesses. They reversed the purpose of democracies and turned these devastated, mutilated lands into authoritarian, oppressive places. I hope no one forgets this outrage committed by our fellow citizens — the killing of the common good by the public at the service of the private — this violence inflicted by the inhabitants of this Veneto upon Veneto itself, a beautiful land, betrayed and violated. Here, everyone knew about Miteni after the 1977 disaster, and yet everyone kept silent, oppressed by money."*

The ISDE Doctor Vincenzo Cordiano approached the questions in a thoughtful way, bringing to the discussion his own relevant experience, both personal and professional.

"After twelve years of relentless activity, during which I participated in hundreds of public awareness meetings and either organized or attended scientific conferences, I cannot help but be pessimistic. Despite all the work carried out by myself with my scientific association, and many other organized environmental organizations or spontaneous movements that emerged following the discovery of PFAS contamination caused by Miteni, I see little to no real

awareness among the vast majority of the population. Even today, in Veneto, I fear many are unaware of what PFAS are and the dangers they pose to people and the health of all living beings."

He articulates his concern regarding the insufficient knowledge and limited awareness demonstrated by the residents of the Agno Valley about this key issue affecting their own land and health. This observation bolsters the central theme explored in the questionnaire entitled, "*Land Relations in the Agno Valley: How Does the Perception of the Human-Nature Relationship Change with Reference to the Construction of the SPV*," previously discussed. Nonetheless, he acknowledges the remarkable efforts undertaken in recent years to spread information and raise awareness within the community.

He also points out that he fears that, despite the progress achieved through restrictions on the use of PFAS, their consumption is likely to increase: "*This despite my repeated warnings that this is an issue of global contamination affecting even the most remote corners of the planet, including the poles. Data from ARPAV confirm that only a few areas in Veneto remain untouched by contamination, even hundreds of kilometers far from the Miteni site. Contamination is primarily concentrated in industrialized areas, where sequential sampling often shows that PFAS concentrations in deep groundwater are gradually increasing. This likely stems from the approximately 500 industrial activities in Vicenza province alone that continue to use PFAS in countless applications and everyday products, legally discharging waste into the environment and surface waters."*

Cordiano affirmed his skepticism regarding the ability of the politicians to impress a decisive change of pace to address and counteract the environmental emergencies confronting us.

Moreover, he says, industrial lobbies wield enormous influence at every level of political and administrative life to the point of leading policymakers into making decisions that defy logic and contradict the findings of independent scientific studies, which warn us that we no longer have time to waste. *"For instance, consider the statement made by Prime Minister Draghi regarding the alleged impossibility of replacing PFAS in industrial production.*[19] *This claim is entirely unfounded from a scientific perspective, as alternatives to PFAS already exist in*

[19] *Ungherese, G. 2024.*

numerous industrial sectors. These alternatives are not only effective but also economically sustainable."

He expressed his concerns for the well-being of his family and loved ones, discussing the measures he has taken to reduce the intrusion of PFAS daily, not without facing significant challenges: "*Like many others, I am deeply concerned about my health and that of my family. However, I see no easy way out. Despite efforts to reduce PFAS exposure, avoiding them entirely seems virtually impossible. For example, we do not know which foods contain PFAS, except perhaps ultra-processed foods that fill supermarket shelves. Even I struggle to eliminate contact with all items that might contain PFAS. While I have stopped using nonstick pans and most waterproof clothing, I cannot entirely avoid using my computer, car, phone, etc. I strive to grow most of the vegetables on my table, but even in my garden, many tools and objects are plastic and may contain PFAS."*

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Wasteocene, Anthropocene, Chtulucene (et. al)

Humanity's domination over ordinary life on Earth is no longer merely a legacy of the most recent centuries: it goes back to the earliest human civilizations and slowly it became tangible and visible. Many of the greatest empires in the history of humans, despite usually handing honors and favors to their deities, were already confident to have power and control over their world, by domesticating plants, animals, landscapes and events. The operated control was facilitated by religion as a key to justify and explain many natural happenings, that, otherwise, would have been left unexplained.

In the cradle of civilization people engaged with the understanding of time, one of the most naturally valuable concepts that today has been completely anthropized. In domains like the agricultural and zootechnic businesses, we slightly forgot the functioning of the natural cadences and intervals, their fascinating rhythms, simply because technological development offered a much faster and easier way to engage with it. We lost precious connections through the need to operate control.

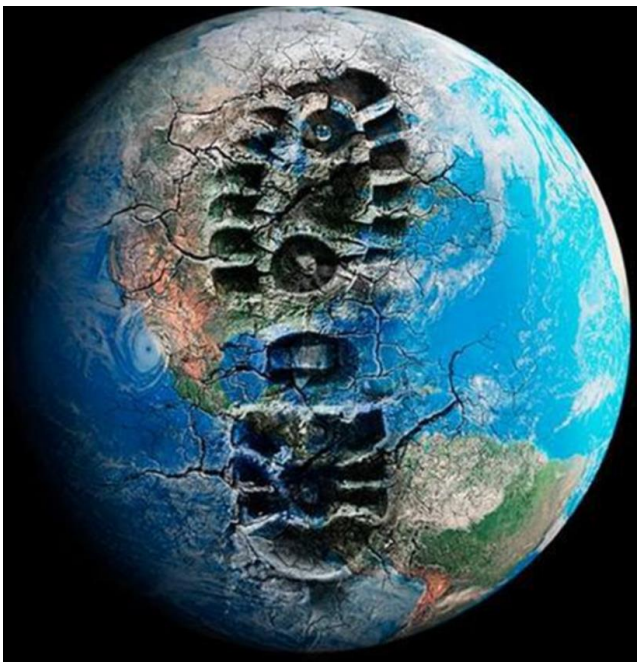
Backbone activities accountable for holding the operational leading of man supremacy have been the widespread agricultural practices, including farming and herding, and the scientific revolution, the time of knowledge accumulation, along with the rapid and most recent technological development, the distribution of practice.

The notions that, over time, we have collected from the direct experience with the environment can be considered the firsts steps in the construction of a man-centered system, where everything works for our own sustainment. Our ways of “getting to know it”, rapidly developed into “getting to control it”. The other components of life are left to be just participants in a game ruled by mankind. Religious-related interpretations bolstered this idea with the creation of a hierarchical importance of beings, by placing humans second only to God(s), thus reinforcing the gradual separation of the human-nature realms.

In the recent literature this separation is addressed through the eco-psychological discourse with scholars confirming that the disconnection between human and the more-than-human

nature took place with the domestication of plants and animals.[20] Others have suggested that this separation can be traced back to historic times, with literacy and numeracy introduction, or even to prehistoric times with the introduction of the first tools and development of language. In different publications it is underlined that with the beginning of the Industrial Revolution we started to build our enclosed spaces (buildings, flats, offices, cars, …). These construction initiatives were crucial in defining the disconnection with the natural environment, with concrete walls setting up the proper boundaries between us and the outside.

In this biphasic context, the milestone is the introduction of *biophilia*: a concept describing the innate and genetically determined affinity that humans inherently develop towards the natural world; as the psychologist Erich Fromm framed in 1973, biophilia is what determines our attachment with everything that is alive and vital, a psychological orientation. Nonetheless, it goes without saying that the current development is diverging from this trajectory. More precisely, it is in these most recent years that the term *Anthropocene* has been increasingly gaining ground on behalf of the current discourse of the human beings' role in shaping the planet.



Picture 12.

The Anthropocene in one picture: the footprint we are leaving on Planet Earth.

[20] *Shepard, P. D. (1982)*

The introduction of the word *Anthropocene* dates back to the 1980s, when the ecologist Eugene Stoermer firstly coined it, referring to the evidence of the impacts produced by the anthropic activity on the Earth. It was the chemist Paul Crutzen that, only twenty years later, popularized it. He suggested that the influence of human activity on the Earth's equilibrium, whose impact led to the evident shaping consequences of climate change, is so significant that it deserves to be framed in a new geological epoch, namely the Anthropocene.

The most common thing most of us envision in their mind when thinking of the Anthropocene is a massive footprint on the Planet, especially over those continents that are more heavily exploited than others for their resources. Not just a simple barefoot print, but a work boot footprint, better if linkable to industrial activities, just like the one shown in *Picture 12*.

The overview of this concept, origins, reasons, and implementations, are overall clear, however it has not been accepted by the Scientific Community; nonetheless it is largely recognized and adopted in informal contexts. The debate is centered on when the onset of this new epoch should be placed (and why should the Holocene end anyway?): many consider its proper commencement with the first agricultural practices, around 12,000 years BP, some believe that its onset should coincide with the Industrial Revolution and the introduction of the steam engine, and others with the first atomic blast. All the proposals are related to the critical signatures that we might have left in the geological records traceable in the rocks' stratigraphy.

Another conceptual way to refer to the current undisputed human (self-determined) primacy over the needs and the rights of a neighboring environment is *Prometheanism*; a term introduced by John Dryzek, Australian political theorist, in *The Politics of the Earth: Environmental Discourses*.[21] While not a true synonym to *Anthropocene* and *Anthropocentrism*, it shares a similar perspective on the existence of the natural surroundings as resources whose utility is determined primarily by human needs and deeds.

This new feeling built a momentum for the human-made engineering in supporting the environmental phenomena, reinforcing the idea of our unlimited ability to act on the natural world by means of technology. In this way, humans are slowly achieving the power to get closer

[21] *Dryzek, J. S. (2013)*

to the desired dominance and control over nature, through multiple anthropic invasive processes.

In the perception of our surroundings and our relationship with it, an interesting point of view is also offered by Tim Ingold in *The Perception of the Environment*[22], in which he delves into what it means for a human being to inhabit an environment: the answer to this question changes depending on the timeline and the geographic position. Ingold drew attention especially to the ethnographic studies in which people make a living out of hunting and gathering, starting with the idea that participation in the world as a living being is a way to perceive it, concluding with an input on how to overcome the definition of a human-centered system framed by the natural one.

A revolution for the dichotomy of *biological* and *cultural* in which Ingold takes into consideration the accounts from biological sciences and the accounts from indigenous people, offering the anthropological approach by giving the narration a context.

The definition of a new geological epoch can be considered as a tool integrating diverse disciplines in giving larger contributions and new perspectives in the confrontation of two realms: nature and culture, whereas culture defines the human-made scenario. The physical fraction of an ontological separation.

The planet we are inhabiting is not featured with simple, linear, and repetitive processes. Although the major terrestrial phenomena could be characterized as *regular*, there are, for each event, specific variables competing for the first place, for the primacy, resulting in an overall unpredictable outcome. One of these competing variables is us, the *Homo Sapiens*, or, to rejuvenate it, the *Homo oeconomicus*, adopting procedures to shape millenarian natural processes for our own pleasure and interests, at the expense of the rest.

In the process of encountering with counterparts and alternatives, similar or slightly different from the Anthropocene, a particular insight stands out: William Grey, scholar of philosophy and deep ecology, defined the search for a non-anthropocentric set of values as a “hopeless quest”, having anthropocentric perspectives as “benign, natural, inevitable and quite adequate

[22] *Ingold, T. (2000)*

for an environmental ethic."[23] On this account, the spontaneous question it rises is: benign for who?, putting in evidence again how central the role played by humans is in our own estimations. The answer does not really give space to characterize or include more-than-human entities.

Moreover, here it can be pointed out that the environmental ethic assumptions state that the fragility of the Planet is supposed to be safeguarded by the humankind, raising once more its deliberate central role; though the many inconsistencies here included can be discussed from the acknowledgement that, as a species, we appeared a micro-geological second ago, in front of the 4.6 billion (estimated) years of the Earth. This aspect, once again, highlights the human *primacy* in the biological pyramid as self-chosen and self-regulated.

Despite its controversies, the word *Anthropocene* has the strength to lead an interdisciplinary conversation between humanists and natural scientists, nonetheless, the simple application of different neologisms and ways to describe our times of mixed signals have the power to amplify the conversation even more, with the inclusion of different contributions coming from poliedric disciplines.

According to the diverse points of view we could adopt to amplify the discussion, other than the comprehensive *Anthropocene*, relevancy has to be granted to the introduction of the money centered concept of *Capitalocene*, followed by the one defining the centrality of troubles and disturbs, *Chthulucene*, the one approaching the generation and accumulation of waste, known as *Wasteocene*, and the one focusing on the homogenization of the lands as the main modelling mechanism of our times, *Plantationocene*.

This latter concept, introduced by Donna Haraway and examined both by Tsing and Haraway, is one of the firsts alternatives to receive attention in the substitution of *Anthropocene*. From this angle, scholars' purpose is to emphasize the human alienation from the natural environment, its times and rhythms, especially in the food chain production. Starting from the conceptualization of a plantation, they highlighted its close connection with diverse kinds of exploitation: from the seeds to the grown plants, from the human labor force to the machinery

[23] *Plumwood, V. (1994).*

- the slavery of mechanical work - especially in the largest monocultures. In three words: multispecies forced labor and, eventually, slavery.

When Haraway delves into the Plantationocene, she puts the accent on the uprooting aspects that any plantation entails per se: there is a rupture of an archaic bond with the soil, when this latter is forcefully shaped by humans' hands into something it was not before. A common mistake is conceiving the plantation endowed with a natural essence: it is, instead, a trait of our ancestral identity to engage with the environment to a point at which it is forced to become something we can rapidly benefit from. A framework of predominance and subordination resulting in an overall homogenization of the landscapes. "Loving and caring feelings for a piece of land are fundamentally incompatible with the Plantation", where the standardization, flatness, and equalization of what is offered from the outside are the main features.[24]

In a specific case study referring to the intimate bond created between the soil and its creatures, specifically focusing on humans, the attention is set on the struggle for survival of fumigated humans and weeds.[25] More specifically, in the Argentinian soy plantations, the biggest agribusiness companies introduced a strong herbicide, Roundup, with the intent to eliminate all unwanted plants except for the main crop, namely soy. The genetically engineered soy (Roundup Ready Soy) can proliferate thanks to the resistance developed to the Roundup herbicide. In response to the repeated applications of Roundup, weeds, of which the most aggressive have been varieties of amaranth, mutated and evolved resistance to the herbicide.[26]

The intent of the quoted article is to highlight the intertwined nature of movements of resistance created by humans and plants struggling against genetically engineered soy monocultures in South America, which the authors provocatively conceptualized as *interspecies resistance*. Local activists and organizations started to oppose the intensified fumigations, because of the gradually lower productivity of the exploited lands and the severe health problems detected among the neighboring populations, caused by the fumigations.

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[24] *collettivo epidemia. (2021).*
[25] *Beilin, K. O., & Suryanarayanan, S. (2017).*
[26] *Beilin, K. O., & Suryanarayanan, S. (2017).*

In order to move the centrality of the *Anthropos* with the proposal of alternatives defining the current geological era, also Wasteocene, Capitalocene, and Chthulucene should be examined.

Picture 12. @CBS News

The world's largest floating plastic island.

The most recent Wasteocene was coined by Marco Armiero and Massimo de Angelis in the article *Anthropocene: Victims, Narrators, and Revolutionaries*.[27] This concept builds on the idea of the Anthropocene but focuses on the socio-ecologic relationship built between humans, the material products of disposing - namely garbage - and the surrounding environment.

Human traces and bequests found in the *organosphere* of organisms that got in touch with them, are defining this newest vision characterized by the imposition of a relationship of wasting, a linear pathway of consumption and waste. It highlights how waste, both the material and the social, is a leading force of our era and how central it is for societal functions. More importantly, Armiero was pushed to idealize this concept since he refused the Anthropocene package because of its *universality*: in fact, this latter approach makes every human being responsible for the current ecological crisis, without considering inequalities, expropriation, and colonial narrations of the recent history.

[27] *Armiero, M., & De Angelis, M. (2017).*

Proceeding with the second alternative-to-the-Anthropocene here outlined, we shall delve into the Capitalocene. There are other scholars and theorists refusing the central role given to the anthropogenic activities in support of the idea that, instead, the capitalistic development would be the chief cause of the disproportionated modifications carried out on the essential processes of the Earth.[28] In fact, the World-Ecology scholar and sociologist Jason W. Moore, in *Capitalism in the Web of Life*[29] revealed his opinion on the use of the word *Anthropocene*.

His critical stance is based on similar argumentations to those of Armiero: Anthropocene is referring to humanity as a "homogeneous acting unit" and does not take into account the peculiar aspects of time and place in the Earth's storyline, as well as the functions of the more-than-human side of the existing beings.

Ultimately, Capitalocene serves to indicate and map out the complex entanglements of relationships built on the exploitation of natural resources' reservoirs on behalf of humans' interests. It refers to the economic sphere as the leading cause, with a focus on the appropriation and distribution of surplus-value and the accumulation of capital.

The last alternative to the Anthropocene that wants to be investigated here is also the most provocative, offered by the multispecies feminist theorist Donna J. Haraway: the Chthulucene. In Haraway's book *Staying with the Trouble – Making Kin in the Chthulucene*[30] the purpose is to provide a reconfiguration of the relations of the earthly inhabitants. She described our epoch as one in which humans and nonhumans are deeply and intrinsically tied in tentacular practices, subterranean connections. At last instance, the Chthulucene intention is to consider the Planet Earth as a holistic, hyper-connected system, in which humans are not self-centered but part of the mutually enhancing entities, humans, non-humans and more-than-humans, promoting the processes of life.

The idea given by the Chthulucene is slightly close to a post-Anthropocene: what would happen if the humankind ceased to be the species with a self-determined central role over the other species? This question serves as the paradigm to investigate these times dominated by disturbance, chaos, confusion. Even Bruno Latour commented that Haraway amplified the field

[28] *Moore, J. W. (2023).*
[29] *Moore, J. W. (2015).*
[30] *Haraway, D. J. (2016).*

of possibilities without falling into science fiction argumentations, the two separated by a very thin line.

The answer provided by the Chthulucene to overcome the current discomfort of a present dominated by disorder, is to flatten the discrepancies in the ranking of different species, by placing humans on the same floor of the other more-than-human and non-human species, as a sole component of a larger and more complex apparatus.

Conclusion and Future Perspectives

"The climate crisis is also a crisis of culture, and thus of the imagination."[31]

Imagination embodies our core need of explaining inexplicable things. Therefore, it is down this path of creativity of mind that we can assess a desirable future for this spoiled land, meanwhile waiting for someone to turn the clods.

The insights of this thesis stem from the desire to give voice to the perception of the polluted conditions of this territory, silently grieving, from the shift of balances and imbalances between human and nature, arising from episodes of environmental disruption.

Thanks to Rob Nixon we are able to picture disasters like the one in the Agno Valley in just two words: *slow violence.*[32] Here lies the real meaning of the climate crisis – unfolding gradually, hidden from plain sight, without immediate impact to ensure that daily life remains undisturbed (needless to say, this is not applicable to all the cases). The intensity of its disruption is distributed across time and space, making it difficult for us to perceive it as a danger, as it is so infinitesimal. "A violence of delayed destruction, an attritional violence that is typically not viewed as violence at all." The kind of violence we are used to, nourished by the media veneration of the grandess, is immediate, spectacular, and dramatic. Yet, we are the sleeping audience to a much different kind of violence, one unfolding on a stage where the act appears to be momentarily suspended. Nonetheless, it is increasing and proliferating at exponential rates, without us paying enough attention since it seems quiet.

To envision a future that differs from the conditions set by the Miteni plant, it is worth it to analyze different viable solutions of requalification, with specific reference to the natural compartments affected. Each of these represent a lens through which we can picture clustered peculiarity and assign ways to take action of remediation. Soil, in which the contaminants were able to deeply penetrate through water; the biota, now under the attentive eye of the researchers, as spots of bioaccumulation; air, where the diffusion is related to the active carbon filters burnt at the end of their efficiency. However, as previously mentioned,

[31] *Ghosh, A. (2016)*
[32] *Nixon, R. (2011)*

incinerators work at temperatures of 700-800°C, but PFAS are successfully removed at the temperature of 1400°C. This mechanism easily disperses the pollutants through the air for kilometers.

But this is a story about liquid legacies, and delving into the case of study, it appears obvious that the main protagonist on the stage is the water compartment. An effective means of transport for the dispersed chemicals indeed. Once this is acknowledged it is due time to provide alternative solutions – alternatives to leaving everything behind, from the chemical plant that is still polluting the soil and the underground waters, to a large part of the population left to ignore the situation.

A water treatment plant would be able to physically address the regional water's lack of safety and building it over the area where the Miteni stands could be the key demonstration that positive stances are taking ground. In order to impart a lesson, the plant would be the less energy-consuming possible.

A significant effort should be made – as it is expected – to make up for the mistakes done in the past: to walk down this path, an effective communication between towns' administrations and the citizens is needed. People should be the central focus of a corrective action plan: this time as active protagonists, rather than passive victims. In general, the plants for water treatment require a huge amount of electricity that, in this case, could be provided by renewables. After the indispensable restoration of the soil under the Miteni premises, the water treatment plant could see its onset, justified by the crimes committed in the past, rooted to the idea of the importance we must give to water, that we, apparently, forgot for a moment, leaving chemical pollutants to bathe freely in our waters, and to dive eventually in our bodies.

Not just yet another establishment of the Valley, but the establishment that could give meaning to the fights, to the things that had been said out loud, and to those left unsaid, to the movements rising against the indiscriminate, harmful contamination; an establishment that speaks with the wisdom of who has risen from its ashes, meanwhile restoring the polluted waters and collecting them with re-distribution purposes.

No matter the costs, no matter the time forecasted for its implementation, the inhabitants of the Valley and the contaminated area need to be reassured, along with the polluters' need to pay.

But this could be just one solution: scientists and researchers are being challenged by the parterre of viable alternatives; adsorption, chemical oxidation, biodegradation, and other methods are being evaluated for the removal and the treatment of contaminated waters.[33]

Thinking of future generations is a big challenge: future generations don't exist, don't consume, don't vote, and don't have anyone to truly defend them. Paraphrasing Groucho Marx, who often used comedy to convey serious truths, many people, even if they would never admit it publicly, are inclined to think: "Why should I care for future generations? What have they ever done for me?".

Wrecked environments urge fertile brains.

The compromised territories of the Agno Valley and the vast areas affected need to be restored without conditions with the available solutions; activities need to be undertaken to promote awareness and sense of morality among the population. In a utopistic vision of reality, the disruptive outcomes of the Miteni case would have been avoided. All that remains for us is to deal with a futuristic vision, utopian or not, to be enacted in the next decade. It is expected to see the Miteni's headquarters demolished and the just willingness of the bodies responsible to be communicative with the civil population. Cause and consequences will have to be taught in and outside of schools, so that this, as one of the grandest aquifer's pollutions of Europe, will not be forgotten.

We need long-sighted strategies to address – and a developed conceptual inventory to understand – the complexities of environmental problems across the globe. It is needed to know what to understand why, to act locally aiming globally. It is needed to deeply review the environmental ethic: nature's intrinsic rights and moral status must be globally assigned and shared. We owe Nature the recognition of natural rights: as we are part of a whole interconnected system, balancing what is good for our species and what is good for other

[33] *Jiang et al. (2024).*

species – biotic and abiotic beings – is the acknowledgment that to serve the interests of one, is counteractive for the holistic wellness.

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Integral answers: English translation and revision

Alberto Peruffo

The primary concerns focus on the physical health of these territories, their biotic and abiotic resilience, their livability, and the risk of diseases for our children and grandchildren. As experts and activists, we experience a dramatic inner conflict when discussing the future with our families and younger generations. “To stay or to leave?”—this is the dilemma, considering the high risks and compromised livability.

We have witnessed too many deaths and illnesses among friends and acquaintances. Just look at the enormous hospital under construction in Montecchio, designed to host thousands of patients suffering from diseases linked to the lifestyle, suffocating pollution, unbreathable air, waters contaminated by PFAS, tannery waste, and even food.

This new hospital rises unexpectedly from the plain, beneath the Castelli hill. It too resembles a tumor—an architectural one. An unintentional monument to the sacrifice of our bodies, and yet a structure that will generate profit, even from treatment.

Providing answers is not easy, especially when addressing concerns about future generations and families. Typically, we envision three options, three scenarios:

The first option advises young people and families: “Leave Veneto.” And if you don’t leave physically, abandon its “idea,” the Veneto model that has made these valleys uninhabitable. You have every right to do so, as your political “fathers and mothers” have handed you a ravaged and poisoned land.

The second, connected to the first, says: “If you stay, fight without reservation.” This means recognizing that if you want a future here, you must fight head-on, without holding back. You are living in sacrifice zones (albeit high-income ones) that domesticate their inhabitants: to remain and live with dignity, you must shift gears and take bold action.

The third option, for those who remain without taking any action, says: “Don’t complain; you are complicit, passively supporting the harm you decry.” It is evident, based on the data, that

the risk of diseases will increase, and for the silent ones, life will become lethargic and servile, wholly consumed by endless, diluted work. In this scenario, some—the elites—overshadow others—the excesses, the toxic waste. Together, they lull themselves into a life that appears beautiful and seemingly prosperous.

However, such a life is poor in meaningful relationships and genuine freedom. It reflects the same opportunistic and "lucky" life [1] touted by the authorities of prosecco, identity festivals, and deafening nightclubs. If this is life… I don't believe it is.

If this message is read in 2050 with a retrospective view, I would say to the authorities and future inhabitants of these valleys, echoing a spontaneous and painful passage from one of the messages sent during the struggle:

"Here, for decades, 'garbage, memory, courage' [2] have been buried. The 'public' authorities abdicated their role for years, sacrificing the 'common' to sell it to the 'private,' to a few private entities, depriving the community of dignity, health, and freedom. You invented pseudo-identities, fictional autonomies, as if we Venetians were some kind of chosen civilization. 'Venetians first,' you shouted, celebrating the 'excellence' while burying the toxic 'excesses.' You reversed the purpose of democracies, transforming these devastated, mutilated lands into authoritarian, oppressive places.

I hope no one forgets this outrage committed by our fellow citizens—the 'killing of the common by the public in service of the private'—this violence perpetrated by the inhabitants of Veneto against Veneto itself, a beautiful land, betrayed and violated. Here, everyone knew about Miteni after the 1977 disaster, yet everyone remained silent, oppressed by money.

But here too a great reaction was born and an incomparable 'civil analysis' in the face of the failure of a civilization that kills and sacrifices its own children, despite having all the tools to defend them—cognitive, educational, and legal tools.

This was the great tragedy, the abdication I mentioned, not only by public authorities but also by moral authorities, fathers and mothers, doctors and professionals, teachers and students, workers, and managers. I hope that from this point—from the failure of this model, from the fracture that became a chasm—a new path has begun, or will begin, for our

democracies, which had or have lost the most fundamental ingredient that sustains every civilization: the 'first politics,' the active participation of citizens in the life of their lands.

This participation is not just about voting, working with your head down, paying taxes (when they are paid), or taking sides, but something much more. Much, much more... if it becomes shared, debated, and considered day by day. That 'more'—which is not for me to define now, but which you all sense—has been missing here for years."

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1. Luca Zaia, *I pessimisti non fanno fortuna. La sfida del futuro come scelta*, Marsilio Editori 2022.
2. Alberto Peruffo, *Non torneranno i prati. Storie e cronache di Pfas e Spannoveneti*, p.44, Cierre Edizioni 2021, second edition with preface by Francesco Vallerani.

Regarding future perspectives, I am fundamentally pessimistic. After tewlve years of relentless activity, during which I participated in hundreds of public awareness meetings and either organized or attended scientific conferences, I cannot help but be pessimistic. Despite all the work I carried out, my scientific association, and many other organized environmental organizations or spontaneous movements that emerged following the discovery of PFAS contamination caused by Miteni, I see little to no real awareness among the vast majority of the population. Even today, in Veneto, I fear many are unaware of what PFAS are and the dangers they pose to people and the health of all living beings.

Many people in Veneto believe that PFAS contamination only affects the "red zones" or areas adjacent to it. Elsewhere in Italy, apart from a few so-called hotspots, it is widely thought that PFAS risks are confined to Veneto or, at most, a few other regions like Piemonte or Lombardia. While considerable progress has been made, with limits and other restrictions imposed on PFAS use and their release into the environment, I fear their consumption is set to increase. For example, it is estimated that plastic production will double by 2050 compared to current levels. Discussions are ongoing in Europe about the proposal for universal PFAS restrictions from five Northern European countries. However, even if this restriction were implemented, PFAS production or use would never be entirely eliminated—only reduced to varying degrees depending on the industrial sector. For instance, estimates suggest that if the proposals from these five countries were accepted, the textile industry would still use 5% of today's PFAS quantities by 2050.

It’s somewhat touching to read recent news about citizens gathering in front of the Vicenza courthouse to demand soil remediation under Miteni and assurances for food safety. Simultaneously, headlines reported on Legambiente’s initiative to monitor Veneto’s rivers, which revealed the presence of PFAS, including newer molecules introduced to replace older ones that are now banned in Europe. These findings appear even in watercourses far from Miteni. This despite my repeated warnings for years that this is an issue of global contamination affecting even the most remote corners of the planet, including the poles.

Data from ARPAV confirms that only a few areas in Veneto remain untouched by contamination, even hundreds of kilometers from the Miteni site. Contamination is primarily

concentrated in industrialized areas, where sequential sampling often shows that PFAS concentrations in deep groundwater are gradually increasing. This likely stems from the approximately 500 industrial activities in Vicenza province alone that continue to use PFAS in countless applications and everyday products, legally discharging waste into the environment and surface waters.

That said, legislative measures in various nations have led to bans on some of the most dangerous PFAS molecules, yielding some results. For example, blood concentrations of two well-known molecules, PFOA and PFOS, are gradually decreasing across studied populations. Recent studies suggest that some toxic effects may also be reversible as blood concentrations decline. In Veneto, reductions in blood cholesterol levels among young people participating in the regional health monitoring program correlate with decreased PFAS levels. In the United States, a study estimated that deaths linked to PFAS exposure dropped from over 300,000 annually to around 69,000, thanks to reductions in PFOS—the most prevalent molecule in Americans' blood.

Like many others, I am deeply concerned about my health and that of my family. However, I see no easy way out. Despite efforts to reduce PFAS exposure, avoiding them entirely seems virtually impossible. For example, we do not know which foods contain PFAS, except perhaps ultra-processed foods that fill supermarket shelves. I struggle to eliminate contact with all items that might contain PFAS. While I have stopped using nonstick pans and most waterproof clothing, I cannot entirely avoid using my computer, car, phone, etc. I strive to grow most of the vegetables on my table, but even in my garden, many tools and objects are plastic and may contain PFAS.

The issue of future generations is a significant problem, especially since, as a collaborator of Obama once said, future generations do not exist—they don’t consume, vote, or have anyone truly defending them. Many talk about the need to ensure a decent world for future generations, but in reality, defending them requires sacrifices so profound they would upend our daily lives—sacrifices we may never see the benefits of. As Groucho Marx humorously yet aptly noted, "Why should I do anything for future generations? What have they ever done for me?"

Currently, I see no politicians with the stature required to initiate a decisive shift or discuss with the population the sacrifices needed to address looming environmental crises. They may not even grasp the severity of the situation. The influence of industrial lobbies is immense, affecting every level of political and administrative life to the extent that policymakers are forced into decisions contrary to logic and independent scientific findings, which warn us that time is running out. Regarding PFAS, consider former Prime Minister Draghi's statement about the impossibility of replacing PFAS in industrial production — a claim unsupported by scientific evidence. Alternatives exist in numerous sectors and are already efficient and economically viable. Unsurprisingly, this view mirrors that of Italian industrial associations and multinationals.

I hope we live long enough to see a young researcher develop a simple, cost-effective method capable of fully destroying PFAS in the environment by breaking them down into non-toxic compounds. Laboratory procedures to neutralize small quantities of these molecules have been developed, but scaling this to industrial levels—where billions of cubic meters of contaminated soil and water need treatment—remains a significant challenge.